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TRANSACTIONS

OF THE

AGRICULTURAL SOCIETIES

IN THE

State of Massachusetts,

FOR

1851.

COLLATED FROM THE ORIGINAL RETURNS

BY AMASA WALKER,

SECRETARY OF THE COMMONWEALTH.

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1852.

ADVERTISEMENT.

Commonwealth of Massachusetts.

Secretary's Office,
February, 1851.

The present publication is more voluminous than any of its predecessors. In addition to the usual matter, it contains an Abstract of the Proceedings of the Massachusetts Board of Agriculture, a voluntary association formed within the last year; also, a Synopsis of the numerous communications addressed to the Executive on the subject of the Potato Rot, in consequence of a reward offered by the Legislature for the discovery of a cure for that disease. This volume, it is believed, will not only be found larger, but more interesting, than any that has gone before it, both in a practical and scientific point of view. The subject of agriculture has attracted more attention during the past than any preceding year, and it seems evident from the spirit now aroused throughout the Commonwealth, that the time is near at hand when efficient measures will be adopted by the State to establish a Board of Agriculture, as suggested in the introductory remarks to our last volume. We trust the transactions of the next year will show that such a

Board has commenced operations. Should that be the case, it will form a new era in the history of our agriculture.

In examining the reports of the several societies for the last year, (in which we have been assisted, as heretofore, by Hon. A. W. Dodge, of Essex County,) we observe a great difference. Some make full and instructive returns of their doings; not merely the award of the premiums, but the statements of competitors as to the animals, crops, or other products for which the premiums are awarded. These reports of their committees give also the grounds or reasons of the awards, and a comparative estimate of the merits of the competitors. Now it is clear, that from these reports and statements, the agricultural community derive no inconsiderable benefit; and that from them are to be drawn such general principles and deductions as will aid the progress of agriculture. It is only by thus recording and publishing facts and experiments, that they become available to all. The advantages of such a practice would seem to be so obvious, and the obligation to observe it so imperative on the societies receiving the State bounty, that it is a matter of regret that any society should fail to adopt it. There are some of the societies,* however, the Berkshire and Housatonic, for example, that are among the most flourishing in the State, that award premiums to a large amount, and apparently require statements of competi-

* The Worcester (West) Society has made no returns, either of reports or statements, but as this is the first year of its existence it is not so censurable.

tors, yet return no statements whatever, or only a few, in regard to the several objects which have gained these premiums. We read the list of successful competitors for their grain crops, their cows and fat cattle, their butter and cheese,—with the sums awarded to them respectively,—but beyond this, a matter comparatively unimportant to the public, all is blank; not a word comes to us, how the crop or animal was raised, what was the cost, and what the profit or loss; how the dairy products are managed, and what the amount produced. Of all this, and much more we would like to know, we learn nothing. If the abstract is good for anything, it is that it gives useful and desirable information. Many of the societies furnish this information. Why should not all? Why should there not be as much ambition to excel here, as in getting up a good show? It needs only proper effort on the part of the officers of the societies, to make the furnishing of these statements an indispensable condition of competing for their premiums, and to appoint only such men on committees as will make full and detailed reports, and they will be forthcoming. Let these reports and statements be returned, with the other doings of the societies, and there will be the proper materials from which to compile the abstract. But we could go even further than this; such returns should be made compulsory, under penalty of a forfeiture of the annual gratuity given by the Commonwealth. If a Board of Agriculture is established, it should be one of its first duties to prepare tables of the average cost of production, of premium crops, animals, &c., &c.; a sample of tables

of this sort, prepared for the Hampden Society, may be found in the abstract of its proceedings. This subject is one of great practical importance, the measure is perfectly feasible, and ought not to be longer neglected. The abstract of this year shows that the cultivation of grain crops, especially rye, have been quite successful; and that wheat is rapidly extending all over the State. There is more attention given to stock than heretofore, particularly to the breeding of horses; in a majority of the exhibitions of the different societies, the show of horses and colts far exceeded that of former years.

In conclusion we may remark, that no year has opened with more auspicious prospects to the interests of agriculture than the present, and we may confidently expect that its close will afford gratifying evidence of progress and improvement.

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ABSTRACT.

MASS. SOCIETY FOR PROMOTING AGRICULTURE.

The President and Secretary of the Massachusetts Society for Promoting Agriculture, as required by the statute, offer the following extracts of reports, showing the transactions of the Society the past year.

The Ayrshire and Devon stock, purchased by this Society, have now passed out of their hands. The county societies have been supplied gratuitously with specimens of the one or the other of these races. Some of these animals may have failed to fulfil the expectations formed of them, but there is good reason to believe that the introduction of these races may prove, on the whole, an important advantage to our farming community.

It may be still a question, whether the farmers of this Commonwealth have faith in the fact, that a good breed may be made better, or are willing to admit that there is any breed of milch cows superior to the (so called) native breed. This is a natural inference from the fact that many of the county societies, who received the stock on condition of annual returns of the state of the animals received, and the number and character of the progeny pure and crossed, have neglected to make such annual returns; some returns have been made, full, accurate and satisfactory.

During the last season, several fine animals of the race, generally known by the name of Alderney, have been imported by the Trustees. Great care was taken in selecting them, and in order to insure a successful result, the Treasurer, T. Motley, Jr., visited the island of Jersey expressly for that purpose.

The expense was not so great as was anticipated,* and would have been less by nearly one half, but for the high cost of freight: a cost, however, which the Trustees think could not well have been avoided, as it was of the utmost importance that all care should be taken of the health and comfort of the stock while on shipboard. They arrived in fine order, and so far as their qualities have been tested, have fully sustained the reputation of this race, for docility of temper, richness of milk, and the economy with which they can be supported. Should this breed prove well adapted to our country and climate, and such there is every appearance that it will prove, there is certainly no race likely to be preferred to them, as a dairy stock. The undersigned have only to add, that on the 26th of December last, a committee of the trustees visited Mr. Motley, for the purpose of examining into the condition of the stock. The weather was intensely cold, (the thermometer standing at one or two degrees above zero,) but the animals seemed to be in every respect in good and comfortable condition. It would be somewhat presumptuous to speak decidedly as to the value of these animals, or of the expectations which should be formed in regard to their descendants, either of the pure breed or of such crosses as may be made with choice animals of our own hardy and valuable stock.

The experiment has been fairly begun, and no exertions will be wanting on the part of the Trustees, to insure its being carried out thoroughly, carefully and judiciously. The following report has been made by Mr. Motley to the undersigned, at their request.

In addition to the monthly reports made of the condition of the animals, belonging to the Society, under my care, it may be desirable at this time to make some remarks as to the probable result of the experiment now making by the Society.

The cattle are of the Jersey breed, imported from the island of Jersey by order of the Society, and have now been in the country seven months, and although hardly sufficient time has

* The aggregate prime cost, at Jersey, of six fine animals, viz., two bulls and four cows and heifers, was a little below three hundred and twenty dollars.

elapsed to prove conclusively how well they can bear the great and sudden changes of a New England climate, still some opinion may be formed, and, I think, a very good one.

On their arrival in this country in May last, they were found to have endured the voyage very well, and all to be in good health and better condition than could have been expected. After a week's feeding in the barn, they were turned out to pasture and treated in every respect as I treated my own cattle, thinking that if they were to be a desirable breed of animals for us to raise, they should be at once put to the test. They were also housed at night, in the fall, at the same time with the other cattle; they are kept in a warm and sheltered barn, but not more so than I conceive every good farmer, who has any consideration for the comfort of his stock and the profit of his business, should have, for I am well satisfied that quite as much depends upon the care in keeping cows well cleansed and warmly housed, as in their feed, for the production of a large quantity of milk.

Thus far they appear to bear the degree of cold we have had the past months, as well as any of the native stocks, or of the Ayrshire breed, of which I have several in my herd; and perhaps it may be well to state here that, by some of the best authorities, the Ayrshire is considered to be a cross between the Jersey and the improved Short Horn; at any rate, the Jerseys have a constitution, which enables them to endure a Scotch winter without injury; and if so, we can reasonably infer that our winters will not be too severe for them. From present experience, I am inclined to the opinion, that they will suffer more from our extreme heat and drought, than from the cold.

In regard to their milking properties, they have not been thoroughly tested, for every one at all conversant with cows, knows very well, that a moderate journey of one hundred miles will almost invariably reduce the product of milk from a cow twenty-five per cent.; how much, then, will a sea-voyage of thirty days, and the consequent fatigue from which it will take much time to recover, and the change from grass to hay, to which they were subjected. You can all judge of the effect

of these causes; certainly the reduction in product of at least fifty per cent. is not an unreasonable calculation.

Notwithstanding this, one of the cows belonging to the Society, four years old, has given from time to time, after calving, fourteen quarts of strained milk per day, of the very richest quality, upon good pasture, without any extra feed. A heifer two years old, with her first calf, has given nine quarts per day, of extraordinary richness, upon the same pasture.

That the Jersey cow is decidedly a dairy cow, there can be no doubt, and by a dairy cow I mean one expressly for the making of butter; that the butter made from her milk will be of finer flavor and richer color than any other, all who have tried it will admit. For the milkman, perhaps, other cows may be more profitable, as for their purposes quantity is more desirable than quality; but for farmers in the neighborhood of large towns, where superior butter will always command a very high price and ready sale, they must prove a very desirable breed of cattle.

This breed is, perhaps, more generally known as the Alderney, which, however, is a mistake, as the animals were sent more than seventy years ago from Jersey to Alderney, for the express purpose of improving the breed of cattle in Alderney.

It is very desirable that the stock now owned by the Society should be increased, as fast as possible, and continued in a state of purity, as the trouble and expense of getting them to this country will prevent extensive importations. At the same time the Society made their importation, other gentlemen, interested in the matter, made like importations of cows, and I would recommend that for the present at least, one of the bulls owned by the Society should be kept exclusively for the use of pure blooded Jersey cows, with the express understanding that all calves from this pure stock shall be raised, and a record kept of every such calf.

The other bull may be used for native cows, with the stipulation that all heifer calves shall be raised, and the bull calves killed: in this way we shall best increase the pure-blooded stock, and improve our native.

The heifer calf dropped by "Brenda" July 9th, and which

was always troubled with dysentery, died November 24th; the rest of the animals, a list of which is annexed to this report, are all in fine health.

Bull	Colonel,	one year old last month.
"	Typhoon,	" " "
Cow	Lady Franklin,	five years old last spring.
"	Countess,	four " "
Heifer	Brenda,	two " "
"	Minna,	one year old "

Heifer calf Alice, born May 22d, 1851.

The cows and heifers are all in calf by "Colonel," as well as all the other Jersey cows imported at the same time. The other bull "Typhoon" has served about fifteen cows from different parts of the State.

I will here remark that it will give me pleasure at all times, to see persons interested in this matter, and to show them the animals and give them all the information I am possessed of in the matter. THOS. MOTLEY, Jr.

Woodland Hill, West Roxbury, *Dec.* 31, 1851.

The public have already been informed of the efforts made by this Society to procure a course of lectures on the anatomy and diseases of our domestic animals, as topics deeply interesting to our farmers, from considerations of humanity as well as economy. Their efforts have thus far proved unsuccessful, owing to the death, in the course of the last winter, of Dr. Edward Brooks, Jr., a young physician of promising talents, who had employed several years in the study of comparative anatomy. It is hoped that his laudable example, in devoting himself to a subject so important, but in this country so commonly overlooked, may find many followers, and it would appear from the following extract from the records of the Society, that the course commenced by Dr. Brooks may be resumed by another lecturer at no distant day.

"Dr. Warren, as chairman of the committee on diseases of animals, and to make arrangements for a course of lectures on

the diseases of animals, made the following report:—The committee, in fulfilment of the directions of the trustees, applied to Dr. Brooks, a promising young man of this city, and invited him to acquaint himself with the diseases of this animal (the horse) and the mode of cure, with reference to a course of lectures. This gentleman readily undertook the task, and, after devoting some time and attention to the subject, returned to Boston, and began his lectures. While preparing to continue them, he was suddenly and violently attacked with a disease which proved fatal. Since this unfortunate event, they have not made any effort as yet to supply the place of Dr. Brooks; but the Committee are happy to say, that a young physician now in Europe, has spontaneously offered to devote such attention to the subject as he may be able, and they have reason to hope that by his intelligence and assiduity, the course may be resumed and completed in a satisfactory manner.

J. C. WARREN."

At a meeting of the Trustees of the Society, Dec. 13th, 1851, after some discussion in relation to a communication from the Massachusetts Horticultural Society, respecting a mode of ripening fruit, practised by D. J. Curtis, of Boston, Dr. Warren offered the following resolutions, which were accepted:—

Whereas, the Massachusetts Society for the Promotion of Agriculture, having understood that a valuable discovery has been made by Mr. Curtis, relating to the preservation of fruits, the retardation of their period of maturation, and the retention of delicate summer fruits in a state of perfection, have appointed a committee to investigate the same, and that committee have reported in part;

Resolved, That the Trustees desire this committee to continue their investigations as to the value of Mr. Curtis's discovery, that they may ascertain particularly what fruits can be preserved, for how long a time, and at what expense; also, whether the mode of accomplishing the preservation will be made known to the public, and if it will be made the subject of a patent.

That they also ascertain whether Mr. Curtis expects any remuneration from this Society for the expenses he has been at, and what may be the amount of this remuneration.

Finally, that they obtain all such information relating to the subject as they are able, and make report at the next regular meeting of the Trustees, or earlier if practicable.

JOHN C. GRAY, *President.*

BENJ. GUILD, *Secretary.*

Boston, *January 9th*, 1852.

ESSEX AGRICULTURAL SOCIETY.

The annual cattle show and fair, by this society, was held at Salem, on Thursday, the 25th of September last. The ploughing match, which was contested by a smaller number of teams than usual, was not surpassed in the execution of the work by that of any former year. The number of cattle, too, was less than might have been presented by the farmers of the county; which may in part be accounted for by the place of the exhibition being on the sea-board; but the show of colts and horses, particularly of stud horses, was very superior.

On a review of what has been done by this society, there is much cause for congratulation. Nevertheless, when we look about and see what others are doing, it is impossible not to perceive that increased efforts are necessary to maintain that comparative reputation, which we have so long enjoyed. On all sides, it is admitted, that the publications made, under the direction of this society, have done much to awaken attention to the importance of improvements in agriculture. For these, there is due to Pickering and Colman, a large debt of gratitude.

When we say that increased efforts are necessary, we refer particularly, to what is wanted on the day of our "Cattle Show." It is not sufficient to bring forward animals enough to absorb the premiums offered, and only enough for this purpose; but there should be a full and fair representation of the stock of the county; and more or less, from every town in the county. Every trustee when he accepts the appointment should feel it to be a duty to see that his town or his neighborhood is fully and fairly represented at the show. Not simply that they may enjoy their share of the bounty, but that they may do their part in diffusing instruction useful to the public.

Is there any town in the county, that could not with ease,

bring forward twenty or more pairs of working oxen? Suppose this to be done by each town, and a brigade of four hundred pair of cattle to be paraded on the day of the exhibition, each town having its own section, under its own guides, selected and arranged under the impulse of that ambition that would not fail to be excited! This would be a "Cattle Show" indeed. Shows like this have been made in other counties; why may they not be made in Essex? Our own eyes have witnessed the present year, a team of *one hundred yoke of cattle* from a single town on the banks of the Connecticut, accompanied by twice this number of the farmers of the town; and we do not remember to have seen, at any time, a more pleasing sight. Let a feeling of generous ambition be awakened in the several towns, to bring forward the best grown, best fed, and best disciplined of their cattle; and without question, they would find ample reward for their exertions, consequent upon the improved condition of their cattle, that would necessarily result from the competition.

In most, if not all the other branches of our exhibition, there is equal room for improvement. Take, for instance, the cultivation of vegetables, a pursuit that engrosses much attention in every town in the county; how little has been shown, in comparison with what has been done? How interesting would be the spectacle, of a table spread by each town, with the best specimens of the products of their soil! Let it be understood that such tables will be prepared, and let there be committees from each town to see that their own town is fairly represented, and there would be such a display of products of the garden and the field, as the eye has not before seen. The rocks of Marblehead and the sands of Methuen, would nobly contend with each other in their exhibition of *squashes:* and the plains of Danvers would bring forth *onions* not a few, to savor the entertainment. A spirit of emulation, of this kind, needs to be awakened, before we can fully appreciate what can be accomplished.

It was particularly gratifying to the farmers of Essex, on the day of their exhibition, to be favored with the presence of the governor of the Commonwealth, and to hear from him the

words of instruction and encouragement. This was as it should be. The farmer merits and needs this encouragement. Content to labor as he does from "early morn to latest eve," and "by the sweat of his brow to eat the bread of carefulness," it is meet that he should be encouraged; and what better encouragement can he have, than the approbation and sympathy of those in authority?

The address before the society was delivered by Rev. Milton P. Braman, of Danvers.

JOHN W. PROCTOR, *President.*
ALLEN W. DODGE, *Secretary.*

MILCH COWS.

The committee examined eleven cows, and awarded the

First premium of $10 to John H. Dunnels, of Ipswich.
Second premium of $9 to Volney C. Stow, of Salem.
Third premium of $8 to Joseph P. Pond, of Salem.
Fourth premium of $7 to Josiah Crosby, of Andover.

John H. Dunnels's Statement.

I offer for premium, my cow, of native breed, eight years old. She calved on the 12th day of July last, and the calf was taken from her on the 15th day of August. She has been kept during the past season on nothing but road feed, four hours each day, with the exception of one pint of meal each morning and evening.

I have kept a daily account of her milk ever since her calf was taken from her, being forty days.

The whole amount of her milk during that time was 1526¼ pounds. Average per day during said time, thirty-six pounds.

IPSWICH, *Sept. 24th*, 1851.

Joseph P. Pond's Statement.

The cow offered for premium by me, is of native breed, nine years old, and calved the 18th of August, 1850. She was bought by her present owner, October 7th, of that year; since which time, viz., two hundred and fifty-three days, ending this day, and commencing fifty days after calving, when she was

bought, she has given 9,281½ lbs. or 26$\frac{1}{2}\frac{2}{5}\frac{3}{5}$ lbs. per day, average, or 10½ quarts per day, (at 2½ lbs. per qt.) average.

Her feed has been common dry hay in winter, with meal and shorts twice each day, and in summer, she has been kept in the Town Pasture, (so called,) where feed has been so short that I have been obliged to feed, as in winter, with meal and shorts twice each day.

Salem, *Sept.* 25, 1851.

Josiah Crosby's Statement.

I offer for premium my Ayrshire cow, seven years old. She calved in April last. During the month of June, she gave upon an average, fifteen quarts of milk per day, and in a few instances she gave eighteen quarts per day. She made in seven days of that time, ten pounds of butter.

She had run in a good pasture, but has had no extra feed of any kind. She generally holds out till within a few days of calving.

North Andover, *Sept.* 25, 1851.

Bulls.

There were five bulls entered for premium,—also two calves not entitled to premium.

One of them, belonging to Jedediah Farnham, of Andover, half Durham and half Devon, being in the estimation of the committee a very superior animal, in size, form and general appearance ; we unanimously recommend to Mr. Farnham, a gratuity of two dollars.

We have awarded the first premium, of seven dollars, to Joseph Kittredge, of Andover; the second premium, of six dollars, to Joseph Henfield, of Lynnfield ; and the third premium, of five dollars, to John Stone, Jr., of Marblehead.

The bull of Mr. Kittredge, was from stock of Samuel Lawrence, while he resided in Lowell, a North Devon, and was unquestionably full blood. In the opinion of the committee he is a desirable animal to cross with any of our stock for working purposes, and many of the half bloods may prove

good milkers. There is probably no stock in the country so uniform in color and appearance as this, and therefore it can be better matched than any other breed.

Mr. Henfield's bull is reported to be half Durham, and is probably of the stock reported. No information was given from what stock he descended. He did not show those decided marks which many of the half Durham exhibit; he is fine dark red, in high condition, not large size, of his age, and of compact form.

Mr. Stone's bull is of the polled or no-horned breed on the side of the mother, but we believe his sire was not of that stock. He is of good size, but not in high condition. He had the appearance of being part Ayrshire.

We believe there are more no-horned cows, in proportion to numbers, that are superior milkers, than of any other race kept in this vicinity. And believing that the male will influence all the qualities of his progeny to some extent, we consider this bull may do much towards improving the milking qualities of the heifer calves, that may be raised from him. We are glad that an opportunity is offered to make the experiment.

The Ayrshire bull loaned to the society, but now entrusted to an individual, was entered for exhibition only. He has been kept in the north part of the county, and it is believed the cows put to him (twenty or more) are with calf, and that the heifer calves will be raised, and the milking qualities of the breed fairly tested.

The committee believe the time will come, and that it is not far distant, when the breeders and even owners of stock, will be more particular, and better informed than they now are, as to the pedigree of the animals they breed from and purchase. That certain races of neat stock have traits peculiar to themselves, which are transmitted to their descendants, is beyond a doubt, and that these peculiarities may be improved and rendered more permanent by attention to the most improved modes of breeding, we have abundant evidence. To profit by this, it is important not only to know we have reared a fine animal, possessing the desired qualities, but from what stock

it proceeded, so that future efforts may be directed by the experience of the past.

Who is to commence this, and how it is to be conducted and perpetuated, we do not undertake to prescribe. If it is an English practice " to keep a herd book " we believe the lovers of fine stock must come to it here, or trust more to accident than they need to do, in accomplishing their desired object.

For the committee,

MOSES NEWELL.

Working Oxen.

Twelve pairs of oxen were entered for trial. Only ten pairs appeared on the ground, and those were well trained, and such as would do credit to any county in the State. Each pair was tried with a load weighing more than two tons, and the weight of the waggon another ton.

The committee regret that it was not in their power (for it did not come within the rules of society) to give Henry Poor, of Andover, a premium for his bull. The manner in which this remarkable animal drew the above load, with an addition of fifteen men, showed plainly that his power in a harness was great, and that he had been well trained.

JAMES STEVENS, *Chairman.*

Breeding Mares.

The committee are of opinion, that a mare for breeding, should be free from any permanent lameness, such as ring-bone, spavin, or founder, or any other material unsoundness. There can be no doubt that there is much risk of the transmission of those infirmities, in some form or other, to their offspring. Other qualifications are also important. Without attempting a general description, we would allude to a few, such as, good size, kind disposition, good form and action, and last, though not least, that she should be an easy and quick traveller. Since

the application of steam, as a moving power, by which we are moved along with great ease and rapidity, we have not patience in a carriage with a horse that can move but five miles an hour.

More horses are now raised in the county of Essex than formerly. But little attention seems to be given to improving the breed. But few of our most valuable mares are put to breeding, until, by high feeding, and over driving, they become of but little value. The first cost of a colt from good stock is small, compared with the after expense of keeping until old enough for use. The price of good horses in market, has doubled within the last twenty years. If prices thus continue, (and to us there seems no reason why they should not,) with good stock as breeders, horses might be raised in this county, at as good profit as other stock.

DEAN ROBINSON, *Chairman.*

Poultry.

The whole number of fowls presented, including about sixty water fowls, and a large lot of beautiful fancy pigeons, was about five hundred. The award of the following gratuities is recommended:

To S. & O. Southwick, of Danvers, for the best collection, consisting of twenty-five coops of fowls, and an equal number of varieties—among which may be named, as very beautiful and pure stock, White Shanghae, Black Spanish, Sumatra, Game, and Irish Game; also, one pair of imported India Game, the only specimen on the ground—the whole showing great care and skill in selection and rearing, $6 00.

To Daniel Putnam, of North Danvers, for a lot of cross breed fowls, very fine. They were accompanied by a statement showing them possessed of great laying qualities, $4 00.

The rearing of poultry is now understood to be a very important branch of rural economy, and to a limited extent, a source of sure and ample profit to the farmer. When viewed in the light of a luxury, merely, in the pleasure afforded

to the proprietor by exercising his taste and judgment in producing fine forms and varied and splendid plumage, and in watching the developments of the young broods in their different crossings, it almost rises to the dignity of one of the fine arts.

If the object is mainly one of pecuniary profit, it becomes an important inquiry to ascertain which of the different varieties it is most profitable to rear, some being most valued for the table, and others for being the best layers. It is known that the flesh of the male fowl, in all the varieties, may be much improved by caponizing, and the committee regret that no specimens have been exhibited to-day. The skill and trouble requisite for this change, would be amply repaid by the greatly improved value of the fowl. We all instinctively eschew bull beef and prefer that of the ox. Why then should we not, by the same means, seek to provide ourselves with that delicate and nutritive meat which has rendered Shakspeare's Country Justice—

"In fair round belly with good *capon* lined,"

the very epitome of good living.

There is still much difference of opinion existing among breeders, as to the relative value of the European and Asiatic varieties, in their qualities as layers and for good flesh. The committee do not propose to enter into the controversy on the origin of the different varieties. It is sufficient to know that there are now many kinds marked by distinct peculiarities, and that they have various good qualities differing from each other. It is the province of the fowl-breeder to combine these excellences by the judicious crossing of the breeds, carefully marking the result in each case. Here is a fine field for competition, and it might be well for the society to require exhibitors to present statements of their manner of keeping their fowls, such as that offered to-day by Mr. Putnam. It would also be well to require the number, or what would be better, the weight of the eggs produced in a given time, as a foundation for the awards.

It is a source of much gratification to witness the high and increasing consideration with which the denizens of the poultry-yard are now held. The great interest in these feathered

tribes, which has sprung up of late years, promises the most satisfactory results. This interest is most strongly manifested when men are so far carried away by their enthusiasm as not only to cackle and crow with delight over their choice young broods, but so far identify themselves with the feathered race as actually to lay eggs—on editors' tables; and when even our grave legislators are contented to SIT so much longer than the most patient of the poultry tribes. People are beginning to appreciate the value of these once neglected races. They see that they not only yield good pecuniary returns, but that in other respects they are the friends and benefactors of our race. Without their aid, what a gloom would be cast over our Thankgiving festival, and what an absurd mockery would it be to congratulate each other on a MERRY Christmas. Suppose the female fowls to be animated by some patriotic impulse,—such, for instance, as was once felt by our Revolutionary mothers in their refusal of tea,—and that they should unanimously refuse to lay eggs, what a revolution would take place in our kitchens and larders, and of what possible use would be books of cookery and housewifery! Sensibility shudders at the solidity of fruit cakes, and humanity mourns over the specific gravity of batter puddings!

We gladly turn from this sad picture to witness the quiet enjoyment of the feathered families as they range their little domain. With what joyful exultation is the advent of each new laid egg announced by the merry cackling of the whole domestic assemblage. How carefully and tenderly the matronly hen attends her young chicks until their arrival to the full maturity of pullethood. How proudly and with what majestic mein and dainty step does Chanticleer walk the barn-yard, and with what courteous dignity and chivalrous courage does he watch over his feathered realm. No wonder that Socrates, the wisest of ancient philosophers, thought this noble bird the most acceptable sacrifice to the immortal gods, and that our Puritan sires placed his effigy on the spires of their houses of worship. He is the herald of the morning, and the clear and ringing tones of his warning voice are first heard to awaken slothful man to the duties of the day. As saith the quaint old legend—

"The cock does crow, to let you know,
If you be wise what time to rise."

The committee are aware that there are some persons in this community who say that they can see no good likely to result from what they sarcastically term this "hen fever." These are the conservative class, those worshippers of the past, who oppose all innovations. We have the most sanguine belief that this dreaded "hen fever" is producing the best results. They may be seen in the exhibition this day of improved races of fowls, and if it did not savor too much of "counting chickens before they are hatched," we would confidently predict a still better show another year. We would even indulge the hope that the march of improvement will go on until it reaches the performance of that famous fowl we read about, of whom it was said, that

"Every day she laid *two* eggs,
And Sundays she laid THREE."

F. POOLE, *Chairman.*

Daniel Putnam's Statement.

The lot of fowls presented for notice to-day, are a sample of my small stock. They have been kept entirely confined to the henery. Of their variety, they are the common "dunghill," crossed with the Black Spanish. The following statement of my hens, would have been more creditable, had not some one, on the night of the 10th of February, entered their premises, and selected from their roost, five of my very best pullets. I regret that I cannot give you the name of the person who took them—as a good judge of hens—whose knowledge, if HONESTLY used, might be of service to the society, and the community.

In addition to the food estimated in my statement, I would say that, during the warm season, they are supplied with grass, sorrel, chickweed, and tops of vegetables, as freely as they will eat. Also the meat of several calves, killed when a few days old, have been given them. They are daily supplied with fresh water.

It may be stated that three pullets, hatched the 12th of

March last, commenced laying, at the average age of four months and five days, and have laid 72 eggs.

September 1st, 1850, my stock consisted of one crower, seven hens, and thirty-one chickens, from three to five months old. September 1st, 1851, of one crower, ten hens, and twenty-nine chickens, from two and a half to five and a half months old.

Number of eggs laid in each month.		Number and price of eggs sold.			
Sept.	94 eggs.	2½	dozen at 33	cents per dozen	$3
Oct.	70 "	20	" 25	" "	5 00
Nov.	33 "	18	" 20	" "	3 60
Dec.	60 "	14	" 18	" "	2 52
Jan.	126 "	12	" 16⅔	" "	2 00
Feb.	168 "	3½	" 16	" "	56
March	173 "	6	" 14	" "	84
April	223 "	2	" 12½	" "	25
May	198 "				
June	161 "	78 doz.			$15 60
July	180 "	3 hens and 19 chickens sold for $8 02.			
Aug.	175 "				

————1661 eggs—or, 138½ doz.

Number of chickens raised	38
Average number of hens	9
Average number of eggs laid by each hen	184
Average price of eggs per doz. sold	20 cents.
Those not sold are valued at	16 cents per doz.

Expense of keeping one year, from September 1st, 1850, to September 1st, 1851:

To 13 bushels of	corn	$9 50
" 7 "	shorts	1 70
"	millet	50
"	sunflower seeds	1 50
"	beets and turnips	70
"	75 pounds soap grease	3 00
		$16 90
Eggs sold		$15 60

Hens and chickens sold	$ 8 02
Value of chickens used	3 77
Value of eggs used	9 60
Value of manure	5 00
	$41 99
Expense of keeping	16 90
Profit	$25 09

North Danvers, *Sept. 25th*, 1851.

Dairy Products.

The several parcels of butter, and the statements, were numbered, and the premiums were awarded before the committee knew by whom the butter was made. The following are the statements of the successful competitors.

John Preston's Statement.

I present a jar containing twenty-eight pounds of June butter, a sample of one hundred and sixty-seven pounds, made from the milk of four cows, from June 1st to July 9th.

Also, a box of fifteen pounds of September butter, a specimen of three hundred and fifty-two pounds, made from May 23 to September 23, from the same cows. We have used and sold four quarts of milk per day. It is probable the cows did not yield so large a quantity within the above named dates as they might have done, had not two of them come in so early as February 20th. Previous to making butter, these two cows fattened six calves for the butcher, the other two one each, making eight calves fattened by the four cows, previous to May 20th, which were sold for $51 20, averaging $6 40 each. The cows have had common pasture till August 1st, since then corn fodder.

Danvers, *Sept.* 25, 1851.

Jonathan Berry's Statement.

I present twenty-five pounds of June butter, being a sample of two hundred and seventy-five pounds, the product of five

cows, from the 20th of May to the 9th of July. Also, seventeen pounds of September butter, a specimen of six hundred and eighty pounds, made from the 20th of May till the 23d of September, from seven cows. The feed of the cows has been a common pasture; since the 1st of August, they have had green corn fodder.

Middleton, *Sept.* 25, 1851.

Benjamin T. Lane's Statement.

I present one pot of June butter, containing twenty pounds, being a sample of one hundred and ninety-two pounds, made from six cows, from May 30 to July 1. Sold and used in the family, five quarts of milk per day. Also, one box of September butter, containing twenty-one pounds, a sample of five hundred and eighty-one pounds from the same cows, with the addition of two more, one the 2d of July, and one the 14th of July, from the 20th of May to the 20th of September; and I sold in the time six hundred quarts of milk and ten quarts of cream, and averaged one quart per day in the family. The feed of the cows has been common pasture, until the 10th of August, when I commenced feeding them with green corn twice a day.

Danvers, *Sept.* 25, 1851.

[Statements respecting the process of butter-making, by Mr. Lane, were published in the *Transactions of Agricultural Societies*, for 1845, and by Messrs. Pope and Preston, in the volume for 1849.]

Paul P. Pillsbury's Statement.

I present three cheeses, weighing sixty-five pounds, made from the milk of two cows. In the month of July, we made ninety pounds of new milk cheese, and sold three hundred and twenty-six quarts of milk; from the 1st of August to the 20th of September, we sold eight hundred quarts of milk, making in the whole, eleven hundred and twenty-six quarts of milk all sold, at four cents per quart, $45 04. The feed of the cows was grass only. They calved about the middle of May. The age of the cows is, one four, the other seven years.

Process of Making.—Set the milk warm from the cows; allow one gill of rennet to four pails of milk; let it remain fifteen minutes; cut it with a knife that will reach the bottom of the tub; let it remain again, until the whey begins to appear; dip it into a basket to drain; put it into a cool place to remain until the same process is performed again; cut the several curds in small pieces, warm them in whey fifteen minutes, salt wholly in the curd, about a table spoonful of salt to a pail full of milk; press it two days, turn it twice a day; put the cheese into an airy room, and turn and butter them once a day.

Andover, *Sept.* 25, 1851.

Vegetable Products.

When the benefits incident to this culture are taken into view, it is quite surprising, that it is not more general, and regarded with more favor. Many instances have come to our knowledge, where the proprietor of half a dozen acres only, has realized more net profit than others in possession of a hundred acres, simply because of the superior skill in the application of labor. It is impossible to pass through the country, without being strongly impressed with the fact, that not one quarter of the lands can be said to be cultivated at all; and the further fact, that they are susceptible of producing at least four times as much as they now do. It is idle in the extreme, to think of abandoning our own soil, for the more fertile prairies of the west, until we have tested their productive powers to their full extent.

Our tables have been loaded, from year to year, with squashes of every form and variety, with quite too little notice of this branch of culture. On looking after it a little, we find in the town of Marblehead, and other places, it is one of the most profitable crops that can be raised. We know gentlemen, whose statements are worthy of entire confidence, who have assured us that they have realized two hundred dollars from the seeds only of the marrow squash, grown on a single acre, in one year. The substance of this vegetable is nutritive and

agreeable to animals, as well as to men; it therefore must be an object worthy of culture. It can be grown, wherever the land is in good condition, and the vigilance of the laborer is in ADVANCE OF THE BUGS. We learn, from the best authority, (Dr. T. W. Harris, of Cambridge, Mass.,) that it has been a prevalent opinion among botanists, that pumpkins and squashes were natives of the eastern continent, from whence they were introduced into America by Europeans. But he is satisfied that they did not begin to be known in Europe, before the discovery of America; and that various kinds of them were found by the first discoverers and first settlers in different parts of North and South America, where they were extensively cultivated by the Indian inhabitants as articles of food. Several kinds had been introduced into Europe, before the settlement of New England. In England, they bore, generally, the name of PUMPKINS, from which winter squashes were not particularly distinguished by name. The word squash, originally applied to the summer squashes, is derived from the Indian name of the same kind of fruit, as we learn from Roger Williams and others. They were found at Montreal in 1535, at Florida in 1539, at Virginia in 1585, at Martha's Vineyard in 1603. Our fathers made great account of fruits of this kind. Says Capt. Johnson :—"Let no man make a jest of pumpkins, for with this fruit the Lord was pleased to feed his people to their good content, till corn and cattle were increased." So we see, that our fathers were not limited in their diet, to CLAMS and FISHES, but had a plenty of SQUASHES, ALSO.

We had contemplated remarks on other classes of vegetables exhibited; such as BEETS, CABBAGES, TURNIPS, CARROTS and ONIONS; but have only time to say, that the splendid strings of ONIONS displayed were indicative of the superlative crops of the present season; which have grown in the town of Danvers and vicinity alone, ONE HUNDRED THOUSAND BARRELS, worth at least, as many dollars.

J. W. PROCTOR, *Chairman.*

Thaddeus W. Harris's Letter.

J. W. Proctor, Esq.,—Dear Sir:—Last evening your box and squashes came safe to hand. I am much obliged to you for

forwarding them. The squashes are indeed "GENUINE," but not the old Valparaiso, introduced by Commodore Porter, some twenty-five or more years ago. They are the "autumnal marrow squashes," first described by Mr. Ives, of Salem, and through him recommended and introduced to general cultivation in this vicinity, and, though subject to vary and degenerate by mixture with other kinds, they have almost excluded the others from our markets by reason of their acknowledged superiority. There is, indeed, but one kind which can compare with them in goodness, namely, that which is called the ACORN SQUASH, of which I shall be happy to distribute the seeds. The autumnal marrow squash is an improved variety, apparently originating from Porter's Valparaiso squash. It was first cultivated in Northampton, whence Mr. Ives procured the seeds. This summer, I raised in my garden a squash weighing twenty-five and three quarter pounds, and three feet six and a quarter inches in circumference. From my own recollection, and from descriptions given me by others, I believe it will turn out to be the Porter Valparaiso squash. The color is bluish green, striped with whitish lines, and irregularly varied with orange-colored blotches. But color is of less importance and less constant than other characters. This squash has a little knob at the blossom end, formed by the base of the pistil, which remains permanently attached. In most other kinds of squashes the pistil falls off with the blossom. My squash, moreover, seems to be the CUCURBITA MAMMEATA, described by Molina, as a native of Chili, and named on account of the nipple-like tubercle at the end. The fruit-stem is precisely like that of the autumnal marrow squash, which also is surmounted at the apex by a little tubercle.

I hear very little complaint of potato-rot. Sometime in the spring or summer of 1849, I wrote an article concerning the insects supposed to produce the disease in potatoes, and made some remarks on the cultivation of these vegetables, and on the St. Helena variety. My article was printed in some newspapers, but I have in vain looked for it, though desirous to refer to it again. I suggested that, perhaps, the St. Helena potato might be constitutionally so vigorous and hardy, as in great

measure or wholly to resist the attacks of the disease. So far as I can learn, my suggestion seems to be verified.

It is to be hoped that those cultivators who have observed the prevalence of insects on their potato-vines this summer, will favor the public with the results. We hope to have accounts from all quarters where the insects have prevailed, of the condition of the crop after digging. In some fields in this vicinity, where I saw the black flea-beetle and some aphides on the potato-vines, in August, I do not hear of any disease having been found in the crop when dug. It was feared that the disease would follow the copious rain that fell in September; but the crop does not seem to have been affected thereby. I suspect that when farmers make their returns, if they speak to the point in full, the insect theory will be overthrown entirely.

Cambridge, Mass., *Nov. 6th*, 1851.

Cranberries.

The committee of vegetable products also reported on this subject as follows :—

A beautiful specimen of the CULTIVATED CRANBERRY, was presented by J. S. Needham, of Danvers. Mr. Needham and his father have given much attention to this subject, and demonstrated that the very best cranberries may be raised on upland. We have tested their cranberries, and know this to be so. We hope these gentlemen will favor the society with a statement in detail, of their culture, as it is an object for which liberal premiums have been offered for years, without securing any statement affording a distinct guide for the cultivation. One thing has struck us as worthy of special notice, on viewing Mr. N.'s bed of cranberries, that is, THE DRESSING that he applies, about the plants and between the rows; which is pulverized mud from the meadow, so as to completely cover the ground. On inquiring the reason of this, we were told it was essential to the perfect growth of the cranberry—that the mud operated like a SPONGE to retain the moisture necessary to support the plant. This being so, indicates very clearly, that Nature made no mis-

take in growing cranberries on meadow land. And the question is, inasmuch as meadow mud is indispensable to their growth, whether it is better to grow the plants on the UPLAND, and bring the mud to them, or to continue to grow them in the meadow and keep THE GRASSES clear from them. We would not speak unkindly of the UPLAND CULTURE of the cranberry—but if they are to COST FIVE DOLLARS a bushel on the upland, and only HALF THIS SUM on the meadow, we think the meadow will continue to be preferred, by those who would pursue the business as a self-sustaining culture.

ROOT CROPS.

The committee have awarded the premiums as follows :—

To Lyman Mason, of Beverly, for his crop of cabbages, $6 00
" Josiah Titcomb, of Byfield, for his crop of onions, 6 00
" Richard P. Waters, of Beverly, for his crop of carrots, 6 00

An entry was made by John Bradstreet, of Danvers, for his crop of potatoes. The committee regret that there was no premium offered by the society, the present year, for potatoes, as this crop is certainly worthy of one. It seemed to the committee that Mr. B.'s success in raising the potato, is owing in a great measure to his thorough mode of cultivation, and in the selection of seed. He plants in the old fashioned way, putting a shovel full of barn-yard manure in the hill ; thinks some farmers mistake in making the hills too near together, and putting too much seed in a hill. He plants mostly his seedlings, called the Danvers Reds ; thinks they do better than any other kind ; has tried others the present season. We saw a part of his crop while they were being dug ; they were a fine specimen, of large sound potatoes, averaging a bushel to sixteen hills.

Knowing Mr. Bradstreet to be a man of much experience and observation in farming, we requested him to give us a statement of his crop, and as particular an account of his mode of cultivation as practicable, which statement is herewith submitted.

LEWIS ALLEN, *Chairman.*

Lyman Mason's Statement.

Upon forty-two rods of loamy soil, manured at the rate of six cords to the acre, one half leached ashes, and one half barn manure, I have gathered two hundred and sixty bushels of carrots, weighing six tons and a half, averaging twenty-five tons, and one hundred and seventy-five pounds to an acre.

Upon one acre and seven-eighths of loamy soil, manured at the same rate as above, I have gathered twelve hundred and eighteen bushels of onions, of full growth and prime quality. All sold in Boston market, at one dollar and six cents to fill a barrel; making a total of five hundred and forty-three dollars, and sixty-two cents, averaging six hundred and fifty bushels, and two hundred and ninety dollars to the acre.

Upon two acres and one half of loamy soil, manured the same as above, I have gathered eighteen thousand one hundred and fifty heads of cabbages, which have brought seventy-five cents per dozen, amounting to eleven hundred thirty-four dollars and thirty-seven and a half cents, averaging seven thousand two hundred and sixty heads, and four hundred fifty-three dollars and seventy-one cents to the acre.

Beverly Farms, *Nov.* 15, 1851.

Josiah Titcomb's Statement.

I employed a surveyor to measure off one acre of my ground, and then measured the onions on that acre, and they made seven hundred and three bushels.

My land is a strong loam; a part of the land has been sowed with onions four years, and a part of it only two years. I plough very shallow in the spring, and put on the ground about four cords of manure to the acre. I sow a part of Danvers seed, and a part of the Old Town seed; get the largest crop from the Old Town seed, the earliest from the Danvers seed.

Byfield, *Nov.* 14*th*, 1851.

Orlando Southwick's Statement.

I make application for premium on a crop of onions, from land measuring one hundred and four rods, yielding three hun-

dred and ninety bushels of onions, of large size and excellent quality. The land is elevated, with generally a southern exposure, and upon about two-thirds of it a crop of onions had been raised last year; on the remainder this was the first crop of this vegetable. The cost of producing this crop was as follows:—

Compost manure, (3-4 stable manure mixed with 1-4 night soil,) 2 1-2 cords at $5 . . .	$12 50
200 bushels leached ashes at 6 1-2 cents, . .	13 00
Two pounds of seed valued at . . .	3 00
Labor valued at	30 00
	$58 50
Value of crop as above, 390 bushels, at 40 cents,	$156 00
From which deduct cost of production, . .	58 50
Leaving a net profit of	$97 50

Danvers, *Nov.* 13*th*, 1851.

Richard P. Waters's Statement.

I offer for premium a crop of carrots, raised on one hundred and twenty square poles of land. By careful measurement, the product was four hundred and forty-two baskets; a basket weight sixty-four pounds, and amounting to more than fourteen tons, and making about nineteen tons to the acre. The soil was a mixed dark and yellow loam; had been fenced off from the pasture the year before, and planted to squashes and corn fodder, and received but a light dressing of manure.

The present season we manured it with three cords of barn-yard manure, the scrapings of the yard after we had finished our planting, and ploughed it in, the latter part of May. It was sowed on the second of June, the rows eighteen inches apart, with one pound of orange and one quarter pound of horn carrot seed. I should think one-sixth of the orange seed failed to come up, and on these vacant spots we set out cabbages. The piece was hoed once and weeded twice by hand. The carrots were harvested on the thirteenth and seventeenth of

November, by running a plough parallel with the rows, within four to six inches of the carrots, and then we turned them out with the spade.

EXPENSES OF CULTIVATION.

Interest on land,	$5 00
Three cords of manure,	18 00
Spreading manure, ploughing, harrowing, raking and sowing,	6 00
Seed,	1 25
Hoeing, weeding, and harvesting,	26 50
	$56 75

Cherry Hill Farm, Beverly, *Nov.* 1851.

John Bradstreet's Statement.

I planted three bushels of two kinds of seedlings, that I have. They were planted in three fields; had fifty-four bushels; found a few rotten in low land. I consider they did well for these kinds. I also planted twenty-eight bushels of my red seedlings on about four and one half acres of land; had eight hundred and eighty bushels, yielding a bushel to every sixteen hills, and a fraction over thirty-one bushels from one bushel of seed. They were planted in four different fields, varying from the fourth to the twenty-eighth of May; one field was the highest land I cultivate, and one small piece was as low as any. The seed and crop were measured. I give the land according to my judgment. They are old fields, that I have cultivated many times. I planted one piece of new sward land, which I consider rather preferable for potatoes, less than one acre, with six and one half bushels of seed, and had two hundred and eight bushels, two hundred of which were of merchantable size, and all were sound. I never raised any potatoes that would yield so well, under every circumstance, as these. Planted early or late, on high land or low, good or shallow, whether the season be hot and dry, or wet and cold, they have always done well, except under trees.

I plough all my land in the spring, as I think land cannot be

too light for this crop. I harrow all my ground with a heavy iron-tooth harrow, only a day or two before I furrow ; I furrow both ways, at a distance that a plough can pass each way. I think many people err by having too many hills, as well as too much seed in the hill. I commonly plough about six inches deep, lowland less; I put all my manure in the hill, one shovel full to the hill. I prefer at least one half such as has been made in my barn yard during summer. I cart it out in the fall in heaps, according to the field where it is to be used, and level the loads to make the heap flat. I like to cart out my winter manure as early in the spring as I can, and tip it on top of the other. I never disturb it until I fill it to put in the hill, minding to mix it well then. To my certain knowledge, there has not been one heap of manure forked over on my farm for forty years, and I believe my crops are as good as others in my vicinity. I know some will say that this manure has lost all its strength, and is about worthless ; but strange to tell, it makes my potatoes grow well. I know the motto now is, to cultivate but little land and manure high ; but I am confident that is not the best way for potatoes; they do not need so much manure, nor that of the strongest kind. As for medicines they need none, and all that is applied to them I consider as quackery in the extreme.

I will here make a few remarks concerning the rot in potatoes. As to the great cause, or why it so differs from that of former years, I believe no man can solve ; but I do believe some preventives may be practised by most farmers, with but little inconvenience and no expense. I always did think, and do now, that the weather has much to do about it ; and I should think the result of the two last seasons was sufficient to convince any man of this. Much depends on the seed, those being best that are hardy and vigorous by nature. With my mode of planting, I have succeeded with old degenerated kinds, to that degree that the price obtained has more than remunerated my losses. But with my seedlings, called the Danvers Reds, my success has been complete. Not a little, in my opinion, depends on the manure. I think mud a bad ingredient, particulary when worked over by hogs, or any other

strong manure. Something too depends on the manner of cultivation, after they are planted, and much depends on the land. That which is mellow and porous, is by far better than that which has a hard pan.

North Danvers, *Nov. 22d*, 1851.

Grain Crops.

There is, at the present time, no subject, which is, or ought to be, more interesting to the farmers of Essex County, than the cultivation of wheat and rye crops, which have been considered by so many cultivators of the soil here, so liable to blight, as to be unworthy their labor and attention. But the statements of claimants for the premiums now offered for the best experiments on these grains, and others heretofore published in the transactions of the Society, tend to show, if they do not prove conclusively, that such notions are erroneous. If the soil be well chosen, well pulverized, and well manured, a good crop of winter rye, and we believe winter wheat also, can be calculated on with as much certainty as other crops, on which our cultivators place their chief reliance.

It is certainly of great importance to the agricultural prosperity of this county, that the farmers should be able at least to raise sufficient bread stuff for their own consumption. Wheat has become an almost indispensable portion of the diet of the people, who pay very seldom less, generally more, than one dollar and fifty cents per bushel for the wheat, which in the form of flour they purchase and consume. Now, if such crops of wheat as have of late years rewarded the farmers of Andover, Methuen, and West Newbury, can be generally obtained, viz., 18, 22, 25, 28, and 35 bushels to the acre, under a culture no more expensive than has been there practised, it must be obvious that it promises to reward the cultivators, as well as most crops on which they have hitherto placed their chief dependence. It would seem that it is spring wheat which has brought the culture of it into disrepute. It did so to some extent, we learn, in Maine, where the culture of win-

ter wheat is now so successful. Fall sown, or what is called winter wheat, is, as far as we learn, everywhere more productive and less liable to blight and other causes of failure than that which is sown in the spring. And from reason and analogy, we should presume it would be so.

Annual weeds injure but little fall sown grain, and winter rye is certainly more productive than that sown in the spring. The culture of wheat in England and on the Continent of Europe, on soils which, like our own, require the restoration in the form of manure of some of the elements of fertility in general, or which are specially needed by wheat, affords better rules for our study, than the practice of those in our own country who cultivate virgin soils. I see no reason why the following, extracted and abridged from Low's Elements of Agriculture, are not nearly as well adapted to New England as they are to Old England. After enumerating and describing the various kinds of wheat cultivated in Great Britain, he says: "Of the species which have been enumerated, greatly the most important in the rural economy of this country is the winter wheat."

"Wheat is of very general cultivation on all classes of soils. But the soils best suited to it are those which are more or less clayey. So peculiarly is wheat suited to the stiffer soils that these are familiarly termed wheat soils. The soils of the lightest class are the least suited to wheat—and are better devoted to other cereals, rye, oats, &c. As wheat is the most valuable of cereals, so it requires greater care to produce it. It is an error to sow with a corn crop any land which is out of order, but this error is greater and more hurtful in the case of wheat, than of the other cereals. Wheat is always sown before winter, when the land can be prepared to receive it. The best period for sowing is from about the middle to the end of September. The early part of October is well suited to the sowing of wheat, and it may be continued to the middle of November. When sown broadcast the land must receive several harrowings, but no more than are sufficient to cover the seed, it being better in the case of wheat that there be a certain *roughness of the clod.* No sooner is the harrowing executed, than the land is to be water furrowed in the following manner:

The common plough with one horse is to pass along the open furrow and then along the open furrows of the head lands, and to draw open furrows into such hollows of the field as water might stagnate in. A person is then to follow with a spade, to clear out the open furrows of the head lands, to make channels through the head lands to the ditch, where necessary—to clear out the cross furrows to the hollows, so as to allow the water to run—and to open up the intersections of the open furrows and those of the head lands."

"The quantity of seed usually sown is from two to three bushels to the acre. In case of summer fallow, the quantity need not exceed two bushels (and so likewise in well manured land from which a summer crop has been taken.) In the spring about three bushels are sown. The seeds, previous to being sown, undergo an operation peculiar to wheat — termed pickling or steeping—*to prevent a disease, termed smut.* The best substance that can be employed for this purpose is stale urine. A very strong pickle of salt dissolved in water, may be used, but salt brine is not quite so secure a means of destroying the infection, as urine. The process of steeping may be thus performed. Let a tub be provided, and partly filled with urine, and let a quantity of wheat, as a bushel, be put in at a time. Let the wheat be well stirred, and all the lighter grains, &c., skimmed carefully off, and thrown aside as useless. The wheat should remain from five to ten minutes, *but never more than ten minutes*, in the pickle. The successive portions of wheat thus pickled are to be allowed to drain a little, and then to be laid on the barn floor in layers, hot lime (lime slacked at the time,) being at the time sifted upon each layer. The purpose of the lime is to dry the grain, which should be carried immediately to the field and sown. When from any cause it is not practicable to sow the wheat for a day or two, it should be spread thinly on the floor, but never kept in sacks, lest it ferment and its vegetative powers become injured."

[Grain perfectly clear and free from smut, may do well without undergoing this process. But the fertilizing effect of this steeping may more than compensate for the expense, and render assurance doubly sure against the disease in question.]

"Wheat sometimes becomes too luxuriant in spring, especially when sown early — and then it is apt to become lodged and run to straw more than to produce grain. In this case it may be pastured, for a short time, with sheep."

"The produce of the crop varies greatly with the seasons, the nature of the soil, and the mode of cultivation. A fair crop may be held to be thirty bushels per acre. The average crop of England does not perhaps exceed twenty-two bushels, and that of Scotland twenty-five. The weight of the straw is reckoned to be about double to that of grain. As provender, that is feed for cattle, wheat straw is considered inferior to that of oats—better than that of barley. In other countries of Europe, it is that which is most esteemed for provender, being generally reduced to chaff. Wheat is subject to various accidents, and diseases, and insects, some of them peculiar to itself." But as no remedy for any of these, except the smut, is suggested by our author, we here close our quotations and refer the reader to the book itself for many other interesting remarks.

The remarkable success of Benjamin Rogers, of Andover, renders his statement specially interesting. The use of leached ashes, which contain much lime and plaster of Paris, is well worthy of notice. Farmers in many parts of Essex, we know, have little faith in the value of the latter article as a manure, but they may be in an error. The effect of gypsum is undoubtedly greater and more obvious in some places than in others. But it by no means follows that it does no good in the latter places. It may well remunerate for the expense which is comparatively trifling, where its benefits are not obvious, and we should recommend its use in all cases on wheat land, in addition to other measures.* Ashes, leached or unleached, should not be omitted. Unleached ashes are often too caustic when applied fresh to growing plants in too large quantities. Hence, with many, they are in less repute than leached ashes. But since we know that potash makes an excellent compost manure with meadow mud, we must believe that the soap boiler extracts from ashes what is far more valuable to the

* Plaster of Paris, on my farm in Middleton, has not generally produced obvious effects. But there we have seen its benefit most decidedly on beans and onions.

farmer, than the lime is, which he adds to them. Clayey lands are best suited to wheat crops. Hence we infer that clay on light sandy soils would prove an excellent manure for wheat. It is well worth the experiment, and should it prove beneficial, the railroads which pass through clay beds might be advantageously used, to convey it to lighter soils in the vicinity of their lines. It would doubtless more permanently benefit such lands than more costly and more perishable manures.

Rye. On the culture of Rye, the statements of the claimants now before us, are unusually valuable. They come from different parts of the county, and show a difference in the preparation of the land, the quantity of seed sown, and in the product obtained, worthy of careful study and consideration. For more convenient reference we have reduced their results to a tabular form.

E. Brown,	1 acre,	seed	1½	bush.	Prod.	48¼	bush.	or	2796¼	lbs.
D. Cogswell	1 "	"	1	"	"	38½	"		2329	"
A. Page	1 "	"	¾	"	"	39	"		2262	"
B. Adams	1 "	"	1½	"	"	36¾	"		2124	"
N. Tapley	1 "	"	1	"	"	24⅕	"		1403⅖	"
" "	" "	"	"	straw	3700	"	"		"	"

The experiments of Messrs. Page and Tapley, both of Danvers, show in a strong light the difference in value of crops of fall and spring-sown grain. These fields were examined by a part of the Committee, before the rye was harvested. The soil of the different fields was very similar, naturally a light gravelly or sandy loam. It would be difficult to say which was best manured or cultivated, and it is decidedly the opinion of the committee, that had Mr. Tapley sown fall instead of spring grain, he would have obtained as large a crop as Mr. Page, who obtained, by cradling too, thirty-nine bushels to the acre, while Mr. Tapley, who reaped his, obtained only 24 1-3.

The very extraordinary yield of Mr. Brown's acre of land, on Marblehead Neck, indicates that either the sea air or sea shore manures, kelp, &c., are peculiarly suited to this crop. In estimating the value of a crop of rye, the straw is an item of no small importance. Mr. Brown sold the straw of his acre, in Boston, for twenty-eight dollars.

Thaer, the celebrated German writer on agriculture, goes into some curious calculations to deduce the produce in straw from that of the grain. He says, that the proportion of grain to straw varies

In rye, from 38 to 42 in 100. In wheat, from 48 to 52 in 100.
In barley " 62 " 64 " " In oats, " 60 " 62 " "

It will be seen on examining the statement of Mr. Brown, and calculating the results, that his crop gave grain 52 to straw 100, and Mr. Tapley's gave grain 51 to straw 100.

Indian Corn. Adino Page's statement shows not so large a product, to be sure, as has been frequently presented by claimants in former years; but when we consider the nature of the soil, and the drought of the season, at the very time that corn crops are most injured by the want of rain, we think his experiment quite as valuable as any that has preceded it. The land on which this crop of Indian corn was raised, is on the northwestern margin of a somewhat extensive plain, which is a prairie in miniature, bounded on the north, west, and southwest, by hills, composed of a stone formation which is a variety of sienite, possessing some peculiar characteristics, not however such as are particularly interesting in an agricultural view, further than is necessary to explain the peculiar nature of the soil and subsoil of this region. The rock is composed of felspar, quartz and hornblend, much the largest part of it being a greenish felspar, which contains a large percentage of potash. This rock, wherever it has been for ages exposed to atmospheric influences, has become extensively disintegrated and crumbled into a coarse rough gravel, and forms the subsoil of the land under consideration. This subsoil is a complete filter, through which the water which falls in rain on this plain, and on the hill sides around it, percolates, is filtered, and becomes purified in a much higher degree than spring water generally found in other places. This plain, we have said, is a prairie in miniature. It was formerly the bottom of a lake. And this corn field was on the margin, where the alluvial deposit is shallow, and so constituted as to drain off all the water that falls upon it. On this naturally barren soil — on land which, if suffered again to become exhausted, would not

sell for thirty dollars an acre, by deep ploughing, liberal manuring, and clean culture, over eighty bushels of corn to the acre has been obtained. And this, we think, is more encouraging to farmers generally, than those experiments on the best soils in the county, where have been raised one hundred bushels to the acre. The tillage of this crop was entrusted chiefly to the paupers of the establishment, it being on the Danvers almshouse farm, and the corn was hilled more than the best management would justify. This was the only fault which those of the Committee who saw the crop on the field, noticed. No weeds were allowed to grow among this corn, which, therefore, received the entire monopoly of the manure.

Mixed Crop. The statement of P. P. Pillsbury, of Andover, of a Mixed Crop of corn and beans, although it did not come exactly within the list of premiums referred to this Committee, was deemed of sufficient importance to merit their attention, and worthy a gratuity from the Society. Mixed crops have not received that attention from farmers of this county which they probably deserve. The mixed crop of corn and potatoes, for which an unclaimed premium has been offered, certainly promises to reward well the experimenter. The potato rot, instead of discouraging the trial, seems to us to offer additional inducements to crop our lands in this manner. At the price which potatoes now command, should they not rot, the acre would with certainty prove much more productive of income than it would if planted with corn alone. And if they should rot, the cultivator would not lose his labor as when he cultivates potatoes, which rot alone; for the corn would not be injured, but most probably benefitted by the manure bequeathed it by its dying partner in occupancy.

By planting, as Washington did, the corn eight feet by two, and the potatoes in the same manner in alternate rows, it will be perceived that the same number of hills is obtained of each, as would be of corn or potatoes alone, when planted four feet apart each way. That more manure would be required or profitably used for the double, than for the single crop, is doubtless true; and that the soil is composed of elements, some of which are consumed much less by the one vegetable than by the other, is also a well established fact in agricultural philoso-

phy. Hence we infer, that a mixed crop can be obtained in one year from the acre of land, of greater value than a crop of either of the plants alone, but at the expense of greater exhaustion of fertility of course. Farmers have long been in the habit of raising mixed crops of some of the following vegetables: Indian corn, pumpkins, beans, turnips, &c., without so noting the gain or loss thereby, as to afford any important information to themselves or others, in regard to the utility of such management. It is certainly very desirable these experiments should be so managed as to establish the true value of the practice. Mixed crops of the cereals, such as wheat and oats, wheat and rye, &c., have been much approved in some districts of New England, and may be well worthy of further experiments. But there are mixed crops too frequently seen everywhere around us, which all good amateur or practical farmers decidedly condemn. These are mixed crops of Indian corn, potatoes, or some of the above named vegetables, with Roman wormwood, and a variety of other weeds, which add nothing whatever to the profits of agricultural operations. Farmers of Essex county, how long will you tolerate such culture?

The Committee award the following premiums:

To Benjamin Rogers, of Andover, for wheat, - -	$6 00
" Ephraim Brown, of Marblehead, for rye, - -	6 00
" Adino Page, of Danvers, for Indian corn, - -	6 00
" Paul P. Pillsbury, of Andover, for a mixed crop of corn and beans, a gratuity - . - -	6 00

ANDREW NICHOLS, *Chairman.*

Benjamin Rogers's Statement.

I offer for premium a crop of winter wheat, called white flint, measuring forty-one and a half bushels from one bushel and three pecks of seed, sowed on one acre and twenty-five and four-tenths rods of land. This land has a northwesterly descent of twelve to twenty feet. The soil varies from a light sandy loam, to meadow mud; the lowest part being so wet, that I was obliged to dig a ditch the length of the field to drain the land.

Last year this piece of land produced about one ton of hay. Soon after it was mowed, it was ploughed with a large plough, at least eight inches deep, and five cords of manure spread and thoroughly harrowed—the manure used was such as is made in hog-pens from meadow mud, loam and barn manure; the seed was sowed and covered with a harrow, and rolled on the thirteenth of September; on the first of May following, thirty bushels of leached ashes were spread, and in June, two bushels of plaster of Paris.

Andover, *Oct.* 18, 1851.

Henry Poor's Statement.

I present for premium, samples of white flint, and blue stem winter wheat. Of the white flint, I measured an exact acre, which produced twenty-six bushels clear wheat. Of the two varieties, it may be difficult to judge which has the greatest intrinsic value for flouring purposes, they both being of the same weight, sixty pounds to the bushel.

The "blue stem," derives its name from the blue shade of the straw, before and after it is ripe, while the other is of a golden color. The "Patent Office reports" from various sections of the country, report more favorably for "Soule's blue stem," than any other variety.

After several years of successful experiments, I trust I shall be pardoned in bringing once more to your notice, this much neglected and all important branch of agriculture in New England. I think it no dream of fancy, that the time is nigh at hand, when the New England farmer will raise his own bread, and to spare—and here, I would ask, what obstacles are in his way? Should he lack *faith*, and *the little he might have, need confirmation*, let him visit this neighborhood, or extend his inquiries into Maine. We all know, good soil and manure are indispensable in producing *any crop*. How little value in comparison with wheat, are all the small grains which every farmer cultivates. No particular *art* or *skill* is required in cultivating wheat. Where general information is had on the subject, we need not fear results.

Andover, *Sept.* 23, 1851.

Ephraim Brown's Statement.

I herewith submit a statement of a crop of Rye, raised on one acre of land, on my farm, on Marblehead Neck. The land had been several years in grass, which became very much rooted out by the *twitch-grass*, and in the spring of 1849, I broke it up, and manured it with a very liberal dressing of rotten kelp, spread on the top of the furrows and harrowed in, then planted it with marrow squashes; after gathering the squashes in the fall, I cross ploughed it again, in order to expose the roots of the twitch-grass to the frost, which in a great measure subdued it. In the spring of 1850, I ploughed it once, harrowed it down, and spread on *again* a very liberal dressing of rotten kelp, which I ploughed in, and then planted it with potatoes, which I dug in September, and the last week in that month I ploughed it and sowed it with one and a half bushels of winter rye. Not thinking of entering this crop for a premium, I was not particular to ascertain the exact quantity of manure used, but I manured liberally, probably six to eight loads to the acre. The rye was reaped the last week in July, and housed the first week in August, and after it had been in the barn about a week, I had it thrashed out, and cleaned up, and measured from the mill, and found it forty-eight bushels, and one peck, weighing fifty-eight pounds to the bushel. The straw weighed 5295 lbs. which I sold as follows: The first load, 2200 lbs. sold for $10 per ton, the second load, 3095 lbs. sold for $11 per ton, total $28 02.

The labor employed on this land, has been nothing more than is usually employed in cultivating land in this way.

Marblehead, *Oct.* 25, 1851.

David Cogswell's Statement.

I send you a sample of rye, raised by me, on one acre of land, from one bushel of sowing. The land is a side hill, the highest part is gravel mixed with loam, and the residue is good soil. It was broke up in the spring of 1849, and planted with potatoes, with two and a half cords of barn manure, and one barrel Guano. In 1850, it was planted with potatoes, five cords

of manure ploughed in; in September, the same year, was sowed down with one bushel of rye and grass seed, without manure. It was reaped in August, 1851, and all cleaned like the sample, and measured thirty-eight and a half bushels, weighing sixty and one half pounds to the bushel; the straw has not been weighed; I should judge there was one and a half tons.

Ipswich, *Sept.* 24, 1851.

Adino Page's Statement.

I present for your examination, the product of a field of winter rye, on the town farm in Danvers. The soil on which it grew, is about an average quality with that of the farm, known to be shallow, light and gravelly.

Where the rye grew, it was broken up in 1849, and planted with corn. In 1850, it was well manured, and planted with potatoes; yielded a fair crop, most of which rotted, as did the others grown on the farm. It was ploughed the latter part of September, deep, with two pair of cattle, and the rye was sown on the fourth of October. It came up and looked well through the winter. A little over one and a half bushels of seed was sown on the piece, containing two acres and nine poles. The field yielded eighty bushels, weighing fifty-eight pounds to the bushel, of as handsome rye as I ever saw. The straw was upright and fair.

Danvers, *Sept.* 1, 1851.

Richard Adams's Statement.

I offer for premium a crop of winter rye, raised on one acre and eight rods of land, being thirty-eight bushels and nineteen quarts and a half, or at the rate of thirty-six bushels, and $24\frac{4}{21}$ quarts to the acre.

The soil is a dark loam, which was manured in the spring of 1850, with eight cords of barn manure, and a crop of potatoes raised thereon. No additional manure was used. On the first week in October, the land was sowed with a bushel and a half of winter rye, and in the latter part of July, 1851, the crop was harvested.

Newbury, *Sept.* 21, 1851.

Nathan Tapley's Statement.

I herewith send a sample of rye, grown on a piece of ground viewed by you before harvested. The product of the same was thirty-two and one half bushels. The measurement of the land is one acre and fifty-five poles. Onions had been cultivated on the land for a number of years, and believing that a change of crop would be beneficial, in the spring, as soon as the land was sufficiently dry to work, I ploughed it, and sowed five pecks of seed on the furrow and harrowed it in. I put a sprinkling of compost manure on about one half of the piece where I thought it most needed. I am aware that the number of bushels per acre, unless there is some distinction between spring and winter rye, does not come up to the requirements for a premium, but the quality I think very fine. I sold it at ninety cents per bushel, except three or four bushels reserved for family use. I have sold thirty-two hundred weight of straw, it being very clear, and good for bunching onions, at fifty cents per hundred at the barn, and have about five hundred weight now on hand, making thirty-seven hundred pounds in all, amounting to eighteen dollars and fifty cents for the straw, and twenty-nine dollars and twenty-five cents for the grain.

Danvers, *Oct.* 1, 1851.

Adino Page's Statement.

I present for your examination, one and a half acres of corn. Where the corn grew, grass was mown in 1850, less than half a ton of poor hay to the acre. After the mowing, I put on eight cords of compost manure, and ploughed it in. In the spring, I cross-ploughed the lot about two inches deeper, than in the fall; I furrowed it only one way, four feet apart, and planted the hills three feet apart, applying about two cords of fine manure in the hills. At the time of hoeing, it was considerably eaten by worms; I thinned it out to four stocks to the hill. It grew luxuriantly until the drought in the last of July and first of August. It then rolled so much, that I feared the crop would be small. It afterwards revived, and when gathered, it yielded two hundred and twenty-three baskets of

fair sound corn—and twenty-four baskets of ordinary quality. I estimate the produce to have been one hundred and twenty-three bushels of corn.

Danvers, *Oct.* 6, 1851.

Paul P. Pillsbury's Statement.

I submit the following facts, relating to the cultivation of a mixed crop of corn and beans, on my farm in Andover. The crop which I offer for premium, was the produce of one acre. The land was broken up in the fall of 1849, and planted in 1850, with corn. Twenty common cart loads of manure spread on to the acre. Crop about fifty bushels per acre.

In the spring of 1851, there were fifteen cart loads of barn manure spread to the acre and ploughed in; then the land was harrowed, furrowed, and manured with eight cart loads of compost manure to the acre. On the twentieth of May, I planted with the Golden Sioux corn, with from three to four kernels to the hill, and the same number of beans. Hills three and a half feet apart each way. Hoed twice. The stalks cut first of September. Corn harvested first week in October, and the crop was one hundred and forty-one and a half baskets, full of ears of corn, weighing forty-one pounds to the basket, and one basket full, of equal weight and measure, kept until the first of November, gave eighteen quarts of shelled corn. The corn when harvested was sound and dry, a sample of which was presented at the Cattle Show in September. There were six bushels of white beans on the acre.

The following is the amount of labor done this season upon this crop. Two men and one yoke of oxen, one day and a half hauling and dropping manure, one man and one yoke of oxen one day ploughing and furrowing, one man and a boy one day planting, hoeing twice, five days labor, cutting and binding stalks two days labor, harvesting corn and beans, seven days labor.

The soil is a brown loam. Land valued at fifty dollars per acre.

Andover, *Nov.* 3, 1851.

Experiments on Manures.

Great diversity of opinion has been entertained by farmers respecting the best method of applying manure to the growing crops. While some have directed to spread on the surface, and then turn under to the bottom of a deep furrow, that evaporation may not readily carry off its more volatile particles, others, on the contrary, insist that it should be spread on the surface, and thoroughly incorporated with the soil, by repeated harrowing. So far as our experience goes, the latter mode is preferable. The salts of animal manures buried deep in the soil, have a tendency to settle in the subsoil, below the reach of the roots of plants, which, if admixed near the surface, give immediate aid to vegetation.

If evaporation of manure near the surface be more abundant, do not the absorbent vessels of the leaf drink in the gaseous fluid with the greatest avidity? Is not evaporation then, one of the most efficacious means of rapidly advancing the growing crop?

The custom has prevailed, and still prevails, to a considerable extent, to haul on the top dressing for grass lands, in the autumn, and leave it in heaps to be spread in the spring. We think a better course is to spread the manure as it is hauled upon the land. It thus protects the roots of the grass, and being settled down by the dissolving snows of spring, has the greatest effect.

Every resource within reach of the cultivator for the increase of his manure, should carefully be made available. Leaves of trees, turf from waste places, and the clearing of drains in low lands, when spread over the barn, or hog yard, soon become valuable. On many farms, an inexhaustible supply of material for the manufacture of a valuable compost, may be found in the peat meadows. It is, indeed, manure itself, for all dry, gravelly, or sandy soils. As a material for compost, peat has been much neglected.

Were the privies of farmers so constructed, as to have a cellar under them, tightly planked, say eight feet long, six feet

wide, and four feet deep, with a door on the back side, the length of the cellar, swinging outward, and upward from the floor, (the building might be placed three feet from the ground with an excavation of one or two feet on the back side, to facilitate the removal of the contents,) the cellar supplied with a cord of peat mud, once a month, and as often removed; the farmer, having a family of six or eight persons, might in this way obtain a dozen cords of the most fertilizing manure, worth on the farm, as manure usually sells in the larger towns, at least sixty dollars. A great annual loss is sustained by farmers through want of economy, in this respect.

JOSIAH NEWHALL, *Chairman.*

Richard P. Waters's Statement.

As no application has been made for premiums on "Experiments on manure," I comply with your request, and state briefly my own practice for several years past to increase the manure heap.

In the month of August or September, we get out from one to two hundred ox cart loads of swamp muck, and lay it near by in the pasture to remain for the winter. During the winter and spring, it becomes pulverized by the action of the weather. So that by the time our planting is over in the spring, it is like an ash heap, and is then taken to the barn cellar, and yard, both of which receive a good dressing from ten to twelve inches thick. We then procure from Salem, two to four cords of stable manure, and spread it over the entire surface of the yard and cellar. We now let the hogs knock it over during the day, for several months, scattering corn over the surface, which induces them to pretty active employment in working over the compost. At night the hogs take lodgings in their own sty, which communicates with the barn cellar and yard, and the cows occupy the premises for the night. As soon as the cows are put out to pasture in the morning, the hogs are let into the yard again, and thus the work is constantly going on, the hogs performing a good service by day, and the cattle enriching the compost during the night. We have now one hun-

dred ox cart loads of this manure, made during the past season, and shall make quite as much more during the winter and spring.

Cherry Hill Farm, Beverly, *Nov.* 28, 1851.

Improving Pasture Lands.

Pasture land has hitherto been more neglected than other lands, and its value has not generally been appreciated. I think that good pasture land will produce as much net income, reckoning it at the price at which it is usually valued, as other lands.

It appears from statistics officially taken in 1850, by the authority of the State, that there are in the county of Essex ninety-eight thousand eight hundred and fifty-seven acres of pasture land, and that it will keep, with the fall feed on the farms, nineteen thousand three hundred and six cows, taking a fraction over five acres to keep a cow, on an average. Now as there are some pastures where from one to two acres will keep a cow, consequently we may suppose there are others that will take seven or eight acres. The difference in the amount of feed produced on good pasture land and poor, is not all. The quality of the feed is much better on good pasture land than on poor, for as the pasture improves, and the English grasses increase, the wild grasses decrease. And this is not all, for where it takes seven or eight acres to keep a cow, the feed is so thin that an animal is necessarily feeding nearly all day to supply the wants of nature, while those kept in good pastures can quickly supply their wants, and then retire to the shadow of the tree to protect them from the scorching sun, or if they choose, refresh themselves on the adjoining knoll.

Now for the comparative profits of the animals. If cows, there will be a great difference in the quantity and quality of the milk. And in autumn, the one kept in the good pasture will be in much better condition than the other. If the animal is designed for beef, one will be ready at almost any time, when its high price or other circumstances require its sale,

while the other, if sold at all, will be deficient in quality and weight.

Now the question is, how can pastures be improved with such limited expense that the additional income will repay, or more than repay the outlay; for unless this can be done, it is not considered profitable farming. This, I find, is the most difficult part of the subject. There is so much difference in soils, in locations, and in the circumstances of the owners of the soils, that it is difficult forming a general rule; but all these things should be taken into consideration, for what is profitable in one case, might not be in another.

And first, I would say, that pastures should not be fed too close, as close feeding tends to bind them out. Some pastures may be profitably improved by the ordinary manner of cultivation and manuring, others by top-dressing with compost manure, and others by ploughing, sowing with rye and hay seed, and feeding the rye instead of cutting it. But pastures cannot be improved in this way but to a limited extent, for most farmers want nearly all their manure for their mowing land, and many pastures cannot be conveniently ploughed, in consequence of hills, rocks, and other obstacles. Leached or dry ashes do well on some lands, but these cannot be procured but in limited quantities.

The best and cheapest way of renovating pasture lands, is by using gypsum on such land as is benefited by it. It can be procured in any quantity,—will cost but about thirty cents per bushel, and will require about one and a half or two bushels to the acre, per year. Some land, however, receives but little or no benefit from it. And some farmers object to its use, on the ground that of itself it affords the plant no nourishment, and that, consequently, it will injure or exhaust the land. Now, in reply, I would say that I am no chemist, and shall not attempt to give the why or the wherefore in regard to its operation, but would simply say that I have seen its effects on pastures for more than thirty years, without ploughing or any other dressing, except what has been dropped by the cattle, and they are now among the best pastures in the vicinity. And further, if pastures can be improved six fold, as I have often seen them,

then there will be six times the droppings from the cattle, and who has not seen the good effects of it especially the liquids? It may be seen for years.

I would earnestly recommend that farmers give gypsum a fair trial, not only on one piece of land, but on different parts of the farm, for although it may not benefit one piece of land, it may an adjoining piece. On the whole, I know of no better way than to improve the best pasture land so far as the extra income will pay the expense. Those old worn-out pastures that cannot be improved without an occasional draft on the purse to pay the expense, over and above the income, may as well go for wood, if wood will grow on them; if not, let them remain as they are, until they can be turned to some better purposes.

JOSEPH HOW, *Chairman.*

Reclaimed Meadow Lands.

As early as the year 1750, the attention of some farmers in this county, was turned to the improvement of their wet meadow. A part of Bishop's Meadow, (so called,) in North Danvers, was then ploughed and sown with grass seed, and for some time yielded large crops. But the improvident waste of the forests by the early settlers in the country, made it necessary for many, at the close of the last century, to resort to their peat meadows for fuel; and this reclaimed meadow was then dug out for peat. But the general use of the cooking stove, and the introduction of hard coal for fuel, have lessened the consumption of peat within the last thirty years, and peat meadows are not now so valuable for fuel, as they were forty years since. It becomes an important inquiry then, how they can be best reclaimed?

It has been the practice of many, in former years, to cart upon them large quantities of gravel. This was done many years ago upon some ten or twelve acres of the farm in Danvers, now owned by George Peabody, of Salem, and although these meadows have some of them been reclaimed more than

forty years, they continue to produce large crops of hay. But where meadow lands are so situated that they can be drained, they may be reclaimed without the expense of gravelling, as the statements of the two applicants for premiums this year show.

In draining land, it is important to know how much the water should be lowered. From our experience, we should say, that the ditches and outlet should be so made, as to drain the water eighteen inches below the surface of the meadow, in the spring, and the early part of summer. As the season becomes dry, it may be well to stop the ditches, so that the water may rise to within twelve inches of the top. We have sometimes seen the evil effects of draining these lands too dry for grass.

If we cannot drain the stagnant water from a meadow, it is not desirable to attempt to reclaim it. We saw a strong illustration of the truth of this remark, when viewing the meadow of Mr. Ware. A neighbor of his wishes to keep his pond at its present height, and to reclaim his meadow. He keeps the water in the pond, but his meadow does not stay reclaimed, although he has expended much upon it. On the farm of the late B. W. Crowninshield, of Topsfield, we saw another illustration of this remark. He had done much upon his meadow, but his neighbor demanded an exorbitant price for digging a ditch a few rods through his pasture, so that the water stands so much upon it, that it kills the English grass.

Both of the pieces of land to which our attention has been directed, were what is commonly called swamp land, and were nearly alike in what they produced; although they were differently situated. Mr. Kimball's farm is far from any village or market town, so that he has no means of obtaining manure, except what is made upon the farm. This being the case, a reclaimed meadow is valuable, not only for what it produces, but as furnishing the means by which other parts of the farm may be improved. The manure which may be made from the stock fed upon the ten tons of hay produced upon this meadow, will add much to the means for enriching his other lands.

From his experiment we learn how that one of the most

uneven, unproductive and worthless swamps may be converted into a smooth and beautiful meadow, for less than forty dollars per acre.

We think, after reading the statement of Mr. Kimball, no one need to be deterred from trying to improve his meadow, because it requires such an outlay of capital. If many more of the foreigners who are coming to our shores by thousands, were employed like the one who improved this swamp, they would do much towards developing the resources of the country. In this way, they might do something towards relieving us of the taxes which are imposed upon us for their support.

We saw, when at Mr. Kimball's, that his cows and apple trees were being benefited by his reclaimed meadow; for instead of feeding his cows upon coarse meadow hay, he puts it around his apple trees, which gives them a smooth and healthy appearance; its usual effects upon cows need not be named.

Mr. Ware's swamp is situated in Marblehead. Its proximity to the sea shore and the large towns, enables him to obtain manure from other sources than the stock of his farm. From the appearance of this swamp we should think that it had never produced a large growth of wood, and at no very remote period, it formed a part of the pond.

He thinks that when he lowered the water in the pond three feet, the swamp settled two feet; so that the pond is not now more than one foot lower than the meadow. When he has completed his ditches so that he can have the control of the water, we think this meadow favorably situated for the production of grass. We do not know what will be the effects of the kind of manure applied to this land for coming years, but the produce this year has been extraordinary, for seed sown last spring. From what we saw, our impression is, that it causes the grass to grow so fast, that it will not stand up, to produce a large crop, but will have to be mowed often. This will be no objection to one who is situated as Mr. Ware is, and wishes to use his hay for making milk. We consider a reclaimed meadow peculiarly valuable upon a milk farm; as the early cut hay and second crop will make a greater flow of milk than well ripened hay.

Whatever may be the intrinsic worth of reclaimed meadows, compared with other parts of the farm, we think that any one who has reclaimed a worthless meadow will have something of the feeling of the man in the parable of the lost sheep; he will rejoice more over that acre, than over the ninety and nine which needed no reclaiming.

The committee award:

To Samuel Kimball, of Boxford, first premium,	$15 00
" Horace Ware, Jr., of Salem, second premium,	10 00

WILLIAM R. PUTNAM, *Chairman.*

Samuel Kimball's Statement.

The swamp land recently viewed by the committee, was surveyed in June, 1851, and contains 5 1-80 acres, including ditches, which occupy seventeen rods of the surface.

Most of it has been a dense growth of pine and maple until within the last seven or eight years. During the winter of 1846, all the wood of any value then remaining on the swamp, was taken off. The original growth on a part of this swamp had been removed many years since, and nothing of value had grown from it; dogwood, alders, the blueberry, and many other kinds of bushes, together with brake, moss, and meadow cabbage, being the principal growth. This swamp has a peat bottom, some parts of it being soft; so much so, that no beast of goodly size could travel over it. Peat had been taken from the highest part of it, though it was with difficulty, on account of water.

In June, 1847, I concluded to drain the swamp in order to clear it of standing water, resolving to reclaim it at some future time. I accordingly employed a man to dig a ditch for that purpose, which cost fifteen dollars and forty cents. I saved twenty cords of peat, taken from this ditch, which I sold, leaving me one dollar per cord, exclusive of all expense.

In June, 1848, I began the work of reclaiming. I hired a man well adapted to the business, for twenty dollars per month, including board; and with bog hoe in hand, and a good muscular arm, he commenced business. The whole surface of

about one acre and a quarter of this swamp was well cut and carefully turned by him, (except the stumps and roots) it being very important to have it well dried by exposure to the sun and wind. In the years 1849–50, the same course was pursued in regard to the remaining three and three quarter acres. As much of it was turned in this way as possible, previous to August, to enable us to burn it the more easily during that month. After burning the top, all the roots and stumps were removed and piled, to be taken off in the winter. Cross ditches were then dug of about one and a half feet in depth, and of the same width, making the beds about three rods in width. Having completed the beds, we seeded down the same to herds grass and red-top. In 1847, my man was at work on the swamps sixty-seven days, which, at seventy-seven cents per day, would be fifty-one dollars and fifty-nine cents.

The second year there were one hundred and thirty-four days' labor expended, at seventy-seven cents per day, amounting to one hundred and three dollars and eighteen cents.

The third year there were eighty-four days' labor expended, at seventy-seven cents per day, amounting to sixty-four dollars and sixty-eight cents.

From this reclaimed piece, I collected at least thirty cords of wood, consisting principally of pine roots and stumps, which I judge were richly worth one dollar per cord, after being piled on the swamp. The old turf ditches were filled with stumps and sods and then a thin coating of gravel was put on the whole of it, say one half of an acre.

After I had seeded down the first acre and a quarter, apprehending a failure of the seed, in the early part of the spring of 1849, I sowed one bushel of spring rye, which yielded a very large crop of straw, and thirteen bushels of grain; and the grass that subsequently grew so thickly, showed that my previous apprehensions were groundless.

The following year, the same piece yielded, in the opinion of competent judges, two tons of good hay to the acre. I also, for the first time, mowed the piece seeded down in 1849, consisting of about two and a quarter acres, and obtained for the first crop a ton and a half per acre. I also mowed one ton of

rowen from the above pieces. During the present year, 1851, from the whole piece nine tons of good English hay have been taken, with the exception of one half acre not seeded down till last March. From the whole piece, I have taken this fall, not far from one ton of rowen.

The principal top dressing for the land consisted of the ashes obtained from the burning of the top surface. On the turf ditches gravelled over, I put fifteen cart loads of compost manure. During the last winter, I put twenty cart loads of compost manure, principally upon the piece first seeded down. I have applied no other and no more manure. On the whole five acres I sowed two bushels of timothy and five of red-top. The proximity of the meadow to my barn, (within forty rods distance,) makes it, in its present state, exceedingly valuable; and my neighbors concur in the opinion that originally, the now beautiful meadow was a very unsightly, uneven, and unprofitable piece of land and water.

Boxford, *Oct.* 18, 1851.

Horace Ware, Jr.'s Statement.

The piece of meadow that I offer for inspection, contains two acres and two thirds, and was purchased by me in January, 1849. It was considered at that time worthless, as for the crop produced, being a foul swamp of briers and bushes, with the margin cut full of holes and ditches; the water standing nearly level with the surface of the land adjoining it, being a pond containing five acres.

My first step was to clear the brush from off the land, which was done that spring. In May I made a ditch from the pond and took away about three feet of the water. In September, I dug a ditch around the margin of the meadow, about four feet deep and two wide, and filled it up two feet with stones, which cut off the high springs most effectually.

I next ploughed it by means of a long rope attached to the plough, with the cattle on the high land; the swamp being too soft to bear them. I then removed the roots and hassocks, useing them to fill up the ditches and holes, and also to build out the edge of the meadow into the pond, to make it even and fair.

The next spring, as soon as it was thawed about two inches, I harrowed and planted potatoes, manuring them with rock weed and kelp green from the sea. My crop was not great, yielding about seventy-five bushels to the acre, worth one dollar per bushel.

In the winter of 1851, I hauled about forty loads of vault manure and mixed with gravel, one part manure to three of gravel, and spread it on, about one and a half to two inches deep. In the spring as soon as the frost was out four inches, I harrowed and cultivated, to mix the gravel with the mud, and sowed grass seed on the 20th of March, viz., one and a half pecks herds grass, three of red-top, and five pounds clover seed. In June, three months after sowing the seed, I mowed the grass which was badly lodged, and got one and a half tons of hay to the acre.

I have since cut the second crop, which was about three fourths of a ton to the acre, and there is now a fair prospect of there being as much more for the third crop, making in all, three tons of hay to the acre. The expense of reclaiming this meadow has been about $75 per acre, leaving a balance in my favor of three tons of hay, which may not be so great as some have done, but is better than nothing.

Salem, *Sept.* 24, 1851.

Farms.

The committee regret that they cannot, from personal observation, speak more generally of the state of farming within the county. We believe there are many farms in our limits, as yet unknown by report of your committees to the society, well worthy of commendation; from the inspection and report of which, in connection with the statement of the management of their owners, much valuable information would be derived, and the cause of agriculture advanced. At present, with us, progress in the cultivation of the soil depends very much upon the dissemination of the practical experiments of our best agriculturists; and until the introduction of schools designed to illus-

trate the principles of science, as they are connected with the cultivation of the earth, we cannot reasonably expect that general improvement in agriculture we desire and believe attainable. Some few of the many farmers, will, by the application of skill and science in their method of farming, distinguish themselves by their increased and improved products; and to these we must look as teachers, and to their statements, as text books in farming, until the principles of agriculture are taught to our youth, as a part of their preparation for the active duties of life.

We have our schools for instruction in law, physic and divinity, more or less patronized by the State; and why should the calling of the great body of the community, be without its public school? Is not this want, in a degree, chargeable to our own remissness in urging upon the Legislature of the Commonwealth, its duty in this respect.

The only farm offered for inspection and premium, this year, is that of William F. Porter, of Bradford, pleasantly situated on the Merrimac River. This farm is well known in the northern part of the county, from the frequency of change in owners, as well as from its general character of fertility. Under most of its late owners, we have no doubt a spirit of improvement has been manifested, evidences of some of which are now visible; but so far as is known to your committee, the progress of improvement had not entitled it to the favorable notice of the society. Since Mr. Porter's occupancy, great improvements have been made in the arrangements of the farm buildings, in the increased convenience in the gathering of the crops, in the feeding out of the same, the arrangement for the housing of the stock, and the securing of their droppings.

The crops of the farm the present year, are good, and the inspection of them bears testimony of the skill and attentiveness of the cultivator. The increase over former years is made evident by the statement of Mr. Porter.

The crop of broom corn attracted the notice of the committee, as being a successful experiment, in a cultivation not common in this county. From the appearance of the crop and the statement of its yield of seed, and broom brush, we believe it may be recommended as a desirable and paying crop, on the

warm lands in the county. We do this more confidently from the double product, the seed and brush of the plant; believing that the successful return of either will compensate the cultivator for his labor. Mr. Porter's opinion of the comparative exhaustion of this crop, and Indian corn, upon the soil, we are not fully prepared to endorse, as in the case of broom corn the bulk of the crop is returned to the soil, while in Indian corn, it is mostly removed.

The remarks of Mr. Porter, on the comparative advantage of stable and compost manure, as a top dressing, we hope will elicit the observation and experiment of our agriculturists.— Composting has of late been a prominent theme of our agricultural writers, and if the application of the basis of compost is equally as effective as the compost, much labor may be saved.

The young orchard named in the statement, was particularly noticed, and commended by the committee. The trees were all thrifty, and of healthy appearance, and gave strong symptoms that a part of the increasing profits of the farm, spoken of in the statement, may reasonably be expected from this source. The trees in grass land, under the treatment of Mr. Porter, appeared fully as vigorous as those on cultivated grounds.

We cannot pass without notice, the home pasture, on which was kept during the season, stock equal to one cow to about two and one quarter acres of land; and from the appearance of the pasture, the condition of the cows, and the amount of milk taken, the feed was not stinted. This is a result in pasturing, which is not usually seen, and forcibly impresses us with the importance of devoting more attention to pasture grounds.

On the profits of farming there exists a diversity of opinions; and the belief that agriculture is not one of the most direct roads to wealth, probably induces many of the sons of farmers to other pursuits of life. If the statements of some of our best farmers are entitled to full belief, no occupation offers more certainty, and few larger hopes of success, than agriculture. And that these statements are reliable, most of us have indications from the profits of some small patches of our land, that by design or accident, may have been devoted to a suitable crop, and cultivated with unusual care. Extended cultivation is proba-

bly the greatest obstacle to improvement; as from our attempt to grasp the whole range of agriculture, and in some cases, perhaps, horticulture, the mind is too much distracted to give sufficient thought, and the labor too much diversified and pressing to be devoted in as full a manner as it should be, to any particular branch. With education adapted to agricultural pursuits, and with farms not too large for the mental and physical powers, we do not believe there is any occupation so desirable for its certainty, healthfulness, and success, to the majority of our young men, as agriculture.

JOSIAH LITTLE, *Chairman.*

William F. Porter's Statement.

The farm offered for the society's premium, I purchased October 9th, 1849, and moved on the same, March 11th, 1850. It is situated in Bradford, and formerly was well known as the Elwell, but more recently, the Silsbee farm. The county road from Haverhill to Newburyport and Salem, passes through the farm. It contains one hundred and forty-seven acres, divided as follows: forty-three and one half acres of pasture, lying southwest of the road; forty-three and one half acres of mowing and tillage, northeasterly of the road, and upon which the principal part of the buildings stand; also, an island of sixty acres, in Merrimac river, the distance across the water from the mowing and tillage land, being twenty rods. In May last I purchased seventeen acres of pasture, adjoining the first named lot; also, sixty-five acres of pasture land, situated in the east parish of Haverhill, making in all two hundred and twenty-nine acres.

The first named pasture, which is a hill very elevated above the surrounding land, consists of a black gravelly loam, with a subsoil of gravel, intermixed with clay, and at a former period a large portion of it was cultivated. The mowing and tillage land is somewhat uneven, and about twenty acres consist of a black moist loam, from eight to twenty inches deep, with more or less slate stones intermixed, and resting upon a hard pan of gravel and clay. About half of the remainder is too low for

cultivation, and was cleared of bushes and alders fifteen years since. This soil is from one to three feet deep, inclining to a peaty nature, and having a similar subsoil to the above. The soil of the rest is a sandy loam, with a subsoil not very dissimlar, and borders upon the river. The soil of the island is a sandy loam, and in digging a well, I find the subsoil very similar, for twenty feet. Two thirds of the surface of the island is elevated about twenty feet above the bed of the river, and more than half the time for the last forty years, has been improved for raising corn, rye, and oats. The other third is ten or twelve feet lower, and about seventeen acres is now covered with a variety of wood, consisting of yellow birch, grey oak, elm, bass, maple and walnut. The wood upon the remaining seven acres was cut off in 1846, and most of this lot, with the preceding, is usually overflowed with water, in the spring freshets. The soil of the pasture in Haverhill, is a gravelly loam, of a reddish cast. The subsoil I have not examined. It is said to be the highest elevation in the county, with one or two exceptions.

Last year I took down the old barn on the farm, and sold the building used for a granary, both of which were ill adapted for the purposes intended, and built a new barn, seventy-five by forty feet, and twenty-six feet post. This barn is situated on the side hill, about one hundred feet northeast of the dwelling house, and has two driveways through the centre lengthwise, twelve feet wide. The upper driveway is thirteen feet above the lower, and is conveniently entered by means of a platform, or bridge, twenty feet in length, and supported at the lower end by a breast wall, ten feet high, the side hill being excavated to a level with the lower floor to afford a convenient entrance to the barn yard and lower floor, which is used for feeding the stock in the leanto, it being on a level with said floor, and for unloading muck or loam through scuttles into the cellar beneath. The hay and fodder are all unloaded from the upper driveway or floor, into bays on either side, both of which are seventy-five feet long by fourteen wide. One is twenty-six feet deep and the other eighteen; the leanto being under the last, fourteen feet wide, and running the entire length of the

barn, is fitted to tie up sixteen cows, and six oxen, and is lighted by five glass windows, having a shelf eighteen inches wide, and three feet from the floor, to protect the windows, and for setting pails while milking. The manure from the leanto is deposited in the cellar, which is under the whole barn, nine feet deep, and open to the south fifty feet, and the cellar wall is from one and a half to three feet thick, mostly laid in mortar.

The frame of the barn is of chestnut timber entire, except the rafters, which are spruce. The body of the barn, except eight feet of the basement, is covered with pine boards twelve inches wide, placed four inches apart, and the intervening space covered with boards eight inches wide, and one and a half inches thick, thus making a tight finish externally, and upon the inside a space for the free circulation of air, which I deem of great importance for the better preservation of the hay.

I also erected last year, a building fifty by fifteen feet, for tool house, work shop, &c., adjoining the southwest corner of the barn, with a basement story eight feet high, the bottom of which is on a level with the lower story of the barn, having a heavy stone wall on one side and one end, the other side being open to the barn yard, for the access of the cattle to the watering trough, which is supplied by a lead pipe, seventy-three feet to a fountain, and made to receive the water of two under-drains which I have laid for the purpose of draining the garden and other land about the buildings. The surplus water from the above trough, is conducted through another lead pipe under ground to a second trough in the barn cellar, and the waste water from this trough passes off in an under-drain to the field below the barn.

I have also erected this season, another building, fifty by sixteen feet, and sixteen feet post, adjoining the northeast corner of the barn, fitted with seven double stalls, each six and a half feet wide, for tying with chains fourteen cows, and a rack to receive the hay from the loft above, and a light box under the rack for grain or cut feed, with a basement beneath built of stone and wood, the bottom being on a level with the barn yard and barn cellar, and is used for receiving the manure from

the cows. These two buildings, with the barn, enclose three sides of the yard, leaving it open to the southeast only, thus making a yard, with the cellar, about ninety feet square, well protected from the cold winds and storms.

I have laid two hundred and ninety feet of lead pipe to carry the water for the use of the cattle, into a brick trough laid in cement, and situated in a basement room or cellar, which I have built of stone and brick, under the northeast end of the L part of the house, twenty feet square. In this room I have a sink and copper boiler, set for scalding cans and milk vessels, into both of which the water is drawn by a faucet. Water is kept continually running into the brick trough at one end and out of the other, and the cans when filled with milk, are set into this trough of water, to preserve an equal temperature, and this keeps the milk sweet a longer time than any other way with which I am acquainted. The water which supplies the milk cellar is taken from a well dug in the pasture opposite my house, and from which there is about ten feet fall. I have laid seventy-four rods of under-drains with stone, for the purpose of conducting off the surplus water from a portion of my orchard, garden, yards, and troughs afore mentioned.

When I purchased the farm, Oct. 9, 1849, I bought all the hay in the barns, except two thousand and fifty pounds. It was estimated by measure, allowing five hundred and twenty-five cubic feet for a ton, amounting to nearly thirty-three tons. The men employed on the farm were of the opinion that not more than six tons had been consumed on the farm of that year's produce, so that the amount of hay cut did not exceed forty tons. Four oxen and one horse were put on the farm Feb. 1, 1850, and twelve cows and another horse, March 11, and this stock consumed all the hay, except four tons, before July 1, the oxen and horse being kept up to hay all the time.

I have bought the manure made at the Eagle House stable, in Haverhill, for the two years past, and paid two hundred and twenty dollars per year, and the quantity has averaged about seventy-five cords a year. Twenty-five cords of this manure I spread upon the mowing land in the spring of 1850, and I believe it increased the quantity of hay that season more than one

third. I planted about eleven acres, viz., six to Indian corn, three to broom corn, one to potatoes, one half an acre of sowed corn for fodder, and one half an acre to carrots and other vegetables; the whole of which was upon land sowed to oats the year previous, without grass seed. The manure for the carrots, potatoes, and about two acres of the corn, was ploughed in, at the rate of five cords to the acre, in its green state. The broom corn, and the remainder of the Indian corn, was planted on the island, and manured with compost in the hill, and at the rate of ten loads per acre, thirty-five bushels to the load. Half a gill of wood ashes and plaster was applied to each hill at the time of planting. I cultivated and hoed three times in the usual manner.

I sowed eight acres of spring rye on the island, on land planted to corn the year previous, with little or no manure, and on which I spread one hundred bushes of leached ashes per acre, and sowed ten pounds of southern clover per acre. These ashes cost six cents per bushel at Haverhill, one mile distant, and were boated to the island for one and a quarter cents per bushel. I sowed an acre to barley, and another to rye, on the home lot, having previously ploughed in about four cords of green manure per acre, and seeded down with one peck of herds grass, one bushel northern red-top, and three pounds southern clover to the acre. Product of corn was two hundred and forty bushels by estimation, rye on the island sixty-four bushels, or eight bushels per acre by measure; rye on home lot twenty and one half bushels, barley twenty-two bushels, potatoes yielded well, but more than one half rotted, and carrots one hundred and fifty-six bushels on one quarter of an acre. Of fruit I had about forty barrels of winter apples, mostly Baldwins, and over three hundred bushels of peaches. Kept in addition to the team, thirteen cows, and during the season made two thousand eight hundred and twenty pounds of new milk cheese, and butter sufficient for the family's use.

The building of my barn, and other essential improvements, occupied so much of my time the first year, that I could not give that attention to the management of the farm, or keep so accurate an account of the amount of sales and the profits and

expenses, as I have done for this year. But I believe, and hesitate not to say, that the amount of sales were ample to pay all the labor for carrying on the farm and maintaining the families, including the taxes, and the manure and ashes which have been bought. In August 1850, I turned over with the plough, five acres of sward land on my home lot, and applied forty cart loads of compost to the acre, made by mixing green manure with an equal part of good loam, meaning always by cart load, about thirty-five bushels. The land was thoroughly harrowed, and I sowed one peck of herds grass, and one bushel of northern red-top per acre, and brushed and rolled the same. I think the product this year was full three tons per acre. The first week in October, 1850, I took off a crop of corn from an acre and a half of land adjoining the river, and ploughed in six cords of horse manure, sowed one and a half bushels of rye, and sowed the same with grass seed. In September preceding, I ploughed sixteen acres of land on the island, turned under all the grass that grew on the land during the season, and which would have made about eight or ten hundred of hay to the acre. Two acres of this land was in the low part before referred to, and had never been ploughed. I sowed one acre of this low land with grass seed only, and the other fifteen acres with rye only, giving it no further dressing.

On the first day of April last, I commenced keeping a daily account of my sales, expenditures, and labor performed on the farm, also the amount of farm produce of every description. On the 24th of April, I sowed one bushel of the Black Sea spring wheat, on two thirds of an acre of land, on the home lot, where potatoes grew the year previous, and seeded the same with red-top and herds grass. On the same and the following day, I sowed twenty-four bushels of oats on eight acres of land on the island, and two bushels of barley on about three quarters of an acre, and seeded the same with ten pounds of southern clover to the acre. This land was in corn, and broom corn the year previous. From the 13th to the 16th of May, I planted three and a half acres of corn, and one and a half acre of potatoes on the home lot. One acre had been planted with corn and potatoes for two years previous, and the

rest was in grass. I ploughed in twenty-five cart loads per acre of green manure from the barn cellar—ploughing ten inches deep—and put in the hills six cart loads of manure to the acre, the ground being furrowed three and a half feet apart each way, and planted with eight-rowed yellow corn, from Northfield, Mass.

From the 16th to the 28th of May, I ploughed and planted five and one half acres of Indian corn, and five and one half acres of broom corn, on the island; one half the above eleven acres was a part of the fifteen acres sown to winter rye, in September previous, and the other half had the grass remaining on it which grew the year previous. The rye when ploughed in had just commenced heading out, and, to facilitate the covering, a brush harrow was drawn over the rye before ploughing. It was furrowed one way only, three feet apart, and across where both rye and grass were ploughed in. It was manured in the hill, with ten cart loads of compost per acre, the hills in the rows being two and a half feet apart, as near as we could judge. Three varieties of corn were planted, viz., three and a half acres with the twelve and sixteen-rowed Canada corn, one acre with the afore-named Pomeroy corn, and one acre with a white corn, called in Plymouth county, the Whitman corn. On that portion of the land where rye was ploughed under, the corn was not as good, and the broom corn not more than two thirds as good as on the other part. To all the Indian corn and broom corn, I applied a small handful of unleached ashes upon each hill, immediately after planting, using ninety bushels on fourteen and a half acres. My Indian corn, broom corn, and potatoes, were all cultivated and hoed three times.

On the 28th of April, I sowed eighty-eight square rods to onions, forty-two rods on land where carrots were raised last year, and forty-six rods on land which was the site of the old barn and yard, and had been raised or filled up with loam and soil of various qualities, from one to four feet. Both lots were manured with stable manure at the rate of eight cords per acre. I also raised one and a half acres of corn fodder. In August last I turned over with the plough two acres of sward land on my home lot, and spread forty loads of compost per acre; sowed

one peck of herds grass, and one bushel of northern red-top per acre; harrowed and rolled in same manner as the lot in 1850. In September following, I sowed ten acres of winter rye, and two thirds of an acre of winter wheat; five acres of the rye, and the wheat on a clover lay, and the remainder on sward land, and on land where my corn fodder was raised this season; the last five acres were manured, at the rate of fifteen loads of compost per acre.

When I came upon the farm, there were sixty old apple trees, one half of which had been grafted five years; forty-five old peach trees, eighteen pear, twelve plum, and eight cherry trees; also two hundred and fifty apple trees, and eight hundred peach trees were set in 1846. Last spring I set one hundred apple, sixty pear, and fifty cherry trees. My young trees embrace many of the best and most celebrated varieties. All my peach trees, and one hundred and seventy of my small apple trees, are in land seeded to grass the year before my purchase. These trees I dig around monthly, from April to October, two to three feet distant from the trunk, and apply two shovels full of leached ashes to each tree in June, and wash the apple trees with strong soap suds. All my trees are upon land of a similar character, a deep, moist and warm soil, and those in the grass land which is highly manured have made as much growth as those in the tillage, and I think will compare favorably with any in the county. I think that my peach trees have done better in grass land than they would in tillage, for they make as much growth of wood as will ripen well, and I have not seen a twig winter-killed since I have been on the place.

I kept last winter, from the produce of the farm, and fifty-two hundred pounds of rowen bought in the spring, twenty eight cows, one bull, six oxen and two horses. I have kept in my home pasture of sixty acres, on an average for five months ending Oct. 20th, (since which I have fed my mowing land) twenty-two cows, one bull and one pair of oxen. My Haverhill pasture is fed by my dry cows and oxen, when not wanted for work on the farm. I sow plaster in April and alternately on one half of my home pasture at the rate of two hundred pounds per acre. This has improved the quality, and increased the quantity of feed full one third.

I have now, Nov. 15, on the farm, thirty-four cows, one bull, six oxen and two horses. I shall reduce my oxen, one yoke, and add sixteen to my present stock of cows, making fifty-five head of cattle, and two horses, which I think I have ample fodder to winter from the product of the farm, with nine tons of salt hay, bought for five dollars per ton, delivered on the river bank. Twenty dry cows, of my stock, will be kept on the island, to consume the hay and fodder raised there, and to be sold the next spring. All my stock kept at home are stabled every night in the year, and a good part of the day in winter. The manure in the barn cellar is mixed with loam or soil, twice or three times a week in about equal quantities. Of swine, I have one breeding sow, five years old, kept in the cellar under the horse barn, and three of her spring litter kept in a piggery in the rear of the house, which I am fattening for family use. They are half blood Suffolk, and I have realized eighty-four dollars for pigs of this sow, sold at eight weeks of age and under, in one year.

Of manure, I have made the last year four hundred and eighty-five cart loads besides seventy-five cords drawn from Haverhill. This manure has been applied to various crops and as top dressing, as before specified. In August, I spread eighty loads of compost on my low land, as soon as the first crop of hay was taken off, and since Oct. 13, I have spread on other mowing land, forty-four loads of compost, and thirty-three cords of stable manure from Haverhill. The result of my experience, is, that stable manure applied as a top dressing to grass land in November, is more beneficial and permanent in its effects upon the succeeding crops, than the same would be composted and spread in spring, taking into the account the labor and expense in composting the same. I have now on hand, about two hundred loads of manure, made in my barn cellar, and twenty cords of stable manure, which I think, with what I shall make from my stock in future, will enable me to keep the farm in a gradual state of improvement, without purchasing any more manure.

The seven acres on the island, where wood was cut, was covered with a heavy crop of wild grass, brush and sprouts, from the

stumps, when I purchased the farm. In May and June, 1850, I cut and mowed the same and raked into winrows with a horse rake, made for the purpose, and burnt it on the ground; then sowed grass seed, and harrowed thoroughly. That year I cut in August, a heavy burden of wild grass and weeds, about one half of which was unfit for cattle to eat; this year I have mowed most of it twice, and think it yielded three tons per acre, of good quality stock hay; much of the first crop was six feet high, and resembled blue-joint, but I think it is a different grass. I have given it the name of Island blue top. I also mowed eight acres of clover on the island where the spring rye grew, and the ashes were spread the last year, which I think yielded one and a half tons per acre. The second crop would have yielded three quarters of a ton per acre, most of which was ploughed in and sowed with rye and wheat, as before stated.

On the home lot, which is the forty-three and a half acre lot, where the dwelling house stands, I mowed thirty acres, making forty-five acres in all; two acres of this lot have been taken for, and is occupied by a railroad; three acres are woodland on the river bank, one and a half acres occupied with the buildings, yards, and road to the river; the residue is in crops before specified. The corn-fodder was grown on land taken from the pasture, and was fed to my cows in August and September. I measured my hay accurately the first day of this month, and allowing five hundred and twenty-five cubic feet for a ton, I cut this year one hundred and twelve and a half tons, besides some thirty tons of straw and corn fodder.

My new milch cows are fed with four quarts broom seed, meal and shorts per day, in winter, with cut hay. I have heretofore fed pretty extensively with carrots, but from careful experiments last winter, I am satisfied they do not increase the quantity of milk. I averaged from twenty to twenty-five cows in milk, summer and winter. Most of the calves were sold when three or four days old. The principal part of the milk is sent to Haverhill every morning, and delivered to customers at four cents per quart, from April first to Oct. 1st, and from then to April 1st, at five cents per quart; the remainder is made into

butter and cheese for the family's use. My cows are principally of the native breed; those that calve in spring and summer, give on an average, four and a half quarts of milk per day for the year, and those that calve in October and November, average five and a half quarts per day. Their milk is increased by going from hay to grass in spring; the others diminished by going from grass to hay in the fall.

I have raised more than thirteen hundred bushels of grain this year, viz: ten and two sixteenth bushels of wheat, twelve and a half bushels of barley, two hundred and fifty-two and a half bushels of oats, two hundred and fifty-six and three quarters bushels of rye, (one acre on home lot produced thirty-eight and a half bushels) three hundred and thirty bushels of broom seed by estimation, worth as much per bushel for cattle and swine as oats. Pomeroy corn on home lot, four hundred and sixteen baskets, the average weight, forty-three pounds per basket; same kind on the island, fifty-six baskets, weight forty-three pounds per basket. Whitman corn on the island, one hundred and six baskets, weight forty-one pounds per basket. Canada corn on the island, three hundred and eighty-four baskets, weight forty-six and a half pounds per basket. Each kind was measured in the same baskets. I shelled two baskets of the Canada corn which made one bushel and five and a half quarts. Allowing eighty pounds of ears for one bushel of shelled corn, I shall have five hundred and thirty-one and eighteen eightieths bushels, and forty-six baskets of small corn. The Canada corn yielded much the best according to the treatment, and was fit to harvest two weeks earlier than the other varieties.

My broom corn was a fair crop, but was injured somewhat by the frost the morning of the 25th of September. I think the yield of the five and a half acres will be full three thousand three hundred pounds of brush, and three hundred and thirty bushels of seed. I raised eighteen cart loads of pumpkins and squashes, mostly among my broom corn, which were fed principally to my cows. I believe broom corn exhausts the land less than any other hoed crop. My oats that grew on land where my broom corn was raised last year, yield one-third more than those where my Indian corn was raised side by side,

and manured alike. I attribute it to stocks of broom corn, which are not fit for fodder, being ploughed in, which is three quarters of the whole in bulk of the crop.

I had forty-two barrels of winter apples, principally greenings, from my old trees, and more than two hundred bushels of fall and cider apples, one hundred and eighty-six bushels of peaches, and pears, cherries, currants, &c., in abundance, for family use. Ninety-two bushels of potatoes, two hundred and sixty-four bushels of onions, and seven and a half bushels of white beans. I hire a man and his wife by the year, who occupy the L part of my house, and who board the remainder of the help. An account of their expenses is kept daily, except so much as is consumed from the products of the farm.

EXPENSES FOR THE PRESENT YEAR.

One man and wife by the year - - - -	$225 00
" " by the year - - - - -	168 00
" " six months, at $14 per month - -	84 00
" " five " " 13 " " - - -	65 00
" " two months and 17 days, $18 per month	47 77
" " " " " " " 20 " " -	53 08
" " one month, $14 per month - - -	14 00
" " " " and 3 days, $14 per month -	15 62
Twenty-seven days work at $1 00 per day -	27 00
Six days work at 5 shillings per day - - -	5 00
One man 12 days, rate of $12 per month - -	5 54
" " 5½ " " " 13 " " - -	2 75
" " 21 " " " 10 " " - -	8 08
One man for the winter, use of house, and $20 00, to tend the stock on the island - - - -	20 00
Salt hay, nine tons at $5 per ton - - -	45 00
Grass seed - - - - - - - -	18 13
Manure - - - - - - - - -	220 00
Ashes, 110 bushels at 13 cents per bushel - -	14 30
Leached ashes, 200 bushels at 6 cents per bushel	12 00
Plaster, 4 tons at $6 per ton - - - -	24 00
Blacksmith's bills estimated by last year - -	33 00

Furnishing and repairing farm tools - - -		$18 25
Toll over Haverhill bridge by the year - -		20 00
Town and county taxes for farm and stock - -		56 82
Shorts, five tons for feeding cows this winter	$20 00	
per ton - - - - - - - - -		100 00
Butchers' bill and groceries to date, for help in farm		
house - - - - - - - - - -		119 65
Estimated by the same to April 1st, 1852, according		
to the number of hands kept in winter - -		19 92
Total expenses for current year - -		$1,441 91

ACCOUNT OF RECEIPTS OF FARM.

Milk sold - - - - - - - -	$1,824 00
Oats sold, 200 bushels, at 45 cents per bushel -	90 00
Rye sold, 135, " " 85 " " " -	114 75
Corn for sale, 200 bushels 75 " " " -	150 00
Rye " " 90 " 85 " " " -	76 50
Wheat " " 10 " $1 50 " " " -	15 00
Broom brush, 3300 pounds, at 10 cents per pound -	330 00
Onions, sold 208 bushels, average 47 cents per bush.	97 76
Onions for sale, 50 bushels at 47 cents per bushel -	23 50
Peaches sold - - - - - - - -	194 25
Apples sold - - - - - - - -	38 75
Rhubarb and vegetables sold - - - -	22 25
Squashes sold - - - - - - - -	26 00
Rye straw for sale, 12 tons, at $8 per ton - -	96 00
Calves sold - - - - - - - -	44 00
Pigs sold - - - - - - - - -	27 00
Estimated profits of wintering 20 cows on the island	200 00
Receipts for the year - - - - - -	3,369 76
Deduct expenses - - - - - -	1,441 91
Net profits for the year - - - -	$1,927 85

It will be seen by the foregoing statements that I have not charged any seed or grain sowed the present season, reserving,

as I have, fifty-two and a half bushels of oats, thirty-one bushels of rye, and more than three hundred bushels of corn, besides barley, potatoes, fruit and various vegetables, more than sufficient for use of families, and farm purposes.

By reference to my daily account of farm work, I find that one hundred and forty-six days' work were performed in digging cellar and well on the island, drawing stone, brick and lumber, for the buildings, and making a new street in Bradford village, by the hands employed on the farm, whose wages are charged in preceding account of farm expenses, and which, if deducted, would lessen the expenses and increase the profits of the farm, more than one hundred dollars. I have made no charge for my supervision, or the labor performed by my son on the farm, but the rent of house, fuel, fruit, vegetables, pork, butter, and numerous articles of family consumption, to say nothing of the satisfaction derived from making not only two, but even three blades of grass where but one grew before, I have considered a full compensation. In addition to the permanent improvements made in buildings, fences, &c., I think it will be conceded, that I have increased the productive capacity of the farm for the year to come, more than five hundred dollars.

My farm, with the buildings erected and repaired since my purchase, and including stock and tools, has cost me about seventeen thousand dollars. Now it will be perceived by the credit in the preceding account, that it has paid an interest on this investment of nearly twelve per cent. The remark has often been made to me by people in my vicinity to this effect, "well, you have got a good farm, and if you get a living from it and pay your expenses, you will do better than any who have owned it before you." Experience has proved the incorrectness of this remark so far as it relates to myself. I believe investments in farming, if the business is carried on with the system, energy, perseverance, economy and skill, which characterize commercial and manufacturing operations, would yield as profitable returns and with much less risk. This report has been extended to a much greater length than I anticipated at its commencement, but had it been more brief, many facts and

statements would have been omitted, which I have deemed important.

There is a reluctance among most farmers to write a report of their farming operations, for the reason that they know not where to begin, or where to end. I must confess that I have felt a difficulty of this kind to some extent, and I would respectfully suggest that a system of questions on farming be prepared, similar in character to those of the New York State Agricultural Society, for the benefit of persons hereafter applying for the Society's premium.

Bradford, *Nov.* 14, 1851.

The Grape Culture.

The committee propose to make some remarks on the cultivation of the grape in this county. They will commence by stating as their deep conviction, that an enlightened regard to the prosperity, health, enjoyment and morals of the community, would lead to an increased attention to the cultivation of fruit; and when the observation is true in regard to fruit generally, it is specially and emphatically so in regard to the grape. For

1. The soil regarded chemically, is known to possess to a great extent, and a rich degree, the elements which are required to give a vigorous and healthful growth, both to the wood and fruit of the vine. It is also believed there is quite as great an extent of territory adapted to the culture of this, as to that of any other produce. This adaptation of soil to grape culture, made manifest by its chemical constituents, is still more forcibly impressed upon us by the fact that the vine springs up, grows rapidly, and produces abundantly in every part of the county, in spite of all the violences that are in one form or other practised upon it. It is doubtful whether there is a farmer, we might almost say a gardener, who, if he would suffer the vines to live and grow, that spring up of their own accord, would not in a very few years have an abundant supply of this delicious and highly valuable fruit.

2. When well cultivated, the grape vine will come into a bearing state earlier than most other fruits. Years that may soon be counted, are all that need pass before the man who sets a vine will be able to feast himself upon the rich productions, which his wise foresight has secured for him. Vines with a good amount of roots, when set, will often show fruit on the second or third year. They have occasionally been known to yield some the very year of their transplanting. The man who will supply himself with a few healthy vines, the present season, may reasonably expect a full supply of this delicious and beautiful fruit in the autumn of the fourth year.

3. Less expense is required in cultivating the grape, than in cultivating most other fruits. We know well that large expense in money and labor may, with good economy, be bestowed on the vine; but we know also that the generality of men will not, and consistently with their means cannot, afford to do this. We feel happy, therefore, in being able to say that such expense is not necessary. A bountiful supply of this delicious fruit may be secured without it. Many have vines growing on their own land, which need only a little care to bring them into a bearing condition. Vines well rooted and which are approaching, or have already reached the bearing state, may be purchased for a very inconsiderable sum, and even if a man has not a vine on his land and is not disposed to purchase one, he has only to take his knife and cut a branch from the numerous vines that grow by the way side, or ask his neighbor to suffer him to do this, with one growing in his neighbor's lot, put this cutting in the earth, perhaps occasionally water the same, and in a very short time he will be refreshed by the fruit which this will in great abundance afford him.

4. Less space of earth is necessary in the cultivation of the vine, than in most other kinds of fruit. There is not a resident in the city or county who possesses two feet square of earth, and a ten foot building, but may for two or more months furnish his family with a rich supply of this fruit. Nor one who has wood or pasture land, but might, after supplying his

family, fill his carts for the accommodation of those who depend on the market, both for the substantials and delicacies of life.

5. Because the grape affords a most grateful refreshment to the sick, the infirm and aged. The committee believe they are supported by observation, and by the authority of the medical faculty in saying that grapes are among the most innocent fruits for those who are placed upon the sick bed, and that they have also a restorative influence, and certainly help rather than hinder the favorable operation of most medicines.

6. Because when once set, vines may be expected to live, grow, and produce fruit for many years. The number of years they have been known to continue seems almost incredible. It would not be easy to point out a period which they have not survived, and what seems worthy of record is, that though in the process of years the amount of their produce may diminish in a small degree, the quality of the fruit becomes of a higher and richer flavor.

If the question be asked, what kind, whether foreign or native grapes, should be sought for cultivation, the committee unhesitatingly answer the native. In fact, the question practically is, native or none. Those able to possess green houses may gratify themselves with grapes of other climes, and the committee would say with all earnestness, let them do it they will thereby add something to their own comfort, something perhaps to their wealth, and often by their liberal distribution to the sick and well, may greatly increase the amount of human enjoyment. But of foreign grapes there never has been, and at present there cannot be, anything like a general diffusion or liberal supply. The cultivation of the foreign kinds costs more time and money than the great body of the community have to bestow. What changes time, increase of knowledge, and change of habits may produce, the committee do not undertake to say, but they have no hesitation in committing themselves so far as to say that the time has not yet come, and will not soon come, when there will be any general supply of any grapes, but those of the native kind, and they are ready to say, that they do not think this fact need be at-

tended with any great sorrow or grief. They are not sure, separate from the influence of prejudice and habit, that the FAR OFF are better than the NEAR BY; certainly not in the state in which we can have them. The avidity with which the grapes of this county are sought when they can be obtained from the woods and wild places about, the gladness with which they are received when gratuitously bestowed, the price which they demand when exposed in market, are sufficient proofs that the fruit as it grows in this State, is in sufficient demand to justify an extensive cultivation, and to leave no just ground of grief, that we cannot possess those which adorn and bless other lands. God has divided these things as it has pleased him, and the committee are fully persuaded that He has not left us in this particular without witness that He is good, and that with Him there is no respect of persons.

They must believe the grape of this country possesses as many valuable properties as those of other countries of a similar latitude, or perhaps we should rather say of a similar clime. Why should it not be so? Ours may not possess some of the excellences which are found in those abroad. On the other hand, there are qualities of a valuable nature in ours, which theirs have not. A warm climate may produce better fruit than one that is cold, but this is not the question now before us. The question is, can foreign grapes be produced generally which upon the whole are better than ours. The committee think not. There are peculiarities which it is thought well to mention, by which many of the grapes of this and some other countries are distinguished from each other. One of these is the foxy taste of ours, and musky taste of theirs. The committee are not certain but these flavors are equally unpleasant, at first, to all, or that they do not become equally pleasant after a little use. The greatest difference, perhaps, may be found in the fact that one has by a train of circumstances, not important to mention, worked itself into fashionable connection, the other is yet mixed with uncultivated life. This disrelish to the foxy taste of our grapes which many entertain, may be, as many such aversions have been, overcome. The oldest portions of the community can well recollect the time when many

would leave the table, and some would faint, if musk-melons happened to be a part of the dessert. The tomato and rhubarb plant have worked their way to general favor at a much later period. A hundred years have not been numbered since a highly respectable physician in Virginia, and his family, were thought to have an idiosyncrasy in their constitution, which enabled them to use the tomato as food, while it would operate as a poison upon others, should they partake of it.

Time and use may produce as great a change in regard to the foxy taste of our grape. But even if it should not; if the foxy taste be a serious objection, a difficulty which cannot be overcome, it should be recollected that it is an objection which lies against only a part, and not always the best part of our grapes. Many indeed of those grapes, which have received the name of the fox, have not, as many have supposed, received it because they had anything of this flavor, but because they are in fact destitute of it, and because, having something of the acid in them, they have been ranked with those in the fable which the fox is said to have rejected and defamed, because he found himself unable to reach the branches loaded with this delicious fruit. In the Middle and Southern States, many, some say most, of the native grapes have a rancid, and if you please so to call it, a foxy taste and smell, and receive the name from this circumstance. But it is not so certainly in many parts of this Commonwealth. Here the term is frequently applied to an acid fruit, which some call the frost or winter grape. If then, any dislike the foxy flavor, they are under no constraint to cultivate them; there are many other varieties, and of good qualities, which have nothing of this peculiarity about them.

Production of vines.—Vines may be produced by planting seed, putting down layers, setting out portions or cuttings of vines containing two or more joints, by dividing the roots, by engrafting and inoculation.

By the first process new varieties may be obtained, and perhaps some of the better quality, and a seedling vine, if the fruit be good, is more valuable than one obtained in any other way, but some years must intervene before fruit in any great quantities and in a fully matured state can be secured by this

process. Besides, experience has shown that a very large portion of vines obtained from seed prove to be male, so that not unfrequently after years of labor and waiting, those who resort to this course find that they have labored in vain.

Vines raised as layers are apt to be feeble for several years, and seldom become as vigorous and productive as those raised from cuttings. In preparing cuttings, which should be taken from branches of the year's before growth, the wood of the upper and lower end should be cut away very near to the bud or joint, and great caution is used not to split the wood or bruise the bud. Some use cuttings of a single joint, cutting away the wood to within an inch on each side of the bud, and others even split the bud and place the parts a few inches deep in the earth. In this last method a vine, if obtained, will be later in coming into bearing, but will have a stronger resemblance, and possess more of the desirable qualities of a seedling, than those obtained by any of what may with propriety be called artificial means.

If persons wish to secure different varieties of fruit, and have vines which they are willing to give up for the purpose, the readiest way is to resort to grafting, or inoculation. By this process fruit may sometimes be obtained the second year, and often the third after the operation : while in doing it, there is very little more skill required than in a like process on the apple or pear tree.

Influence of soil, &c.—There is no fruit with which the committee are acquainted, upon which, in their opinion, cultivation, soil, location, manure and pruning, produce so great changes as they do upon the grape. Its size, shape, color, flavor, time of maturing, are all obviously affected by these influences. We have a striking illustration of this remark in the Walker grape. This is a fruit which has long been known. The original vine is still standing, and thriving in its native place, in East Haverhill. The fruit is fine, and being held in high estimation, has been cultivated somewhat extensively in the north part of the county, and as it has been spread about, it has received almost as many names as there have been persons who have cultivated it, or places into which it has been introduced. There has not a year passed, as the committee believe, since fruits have been

exhibited at our annual fair, but specimens of this grape have been offered. In almost every instance, it has come under different names. The present year there were certainly two, the committee believe three, specimens exhibited, neither of them bearing the original name, though upon a little inquiry, it was ascertained beyond a doubt, that the vine in Haverhill was the source from whence they came. The shape color, and flavor of these specimens, have been almost as various as their names, and they have been spoken of in our reports, as different fruits. The committee do not think it strange that it it should be so. For though the discriminating marks of this fruit are sufficiently obvious to those somewhat familiar with it, they are such as might well pass unnoticed in a hasty and confused examination. One thing is worthy of notice, that under whatever name it has been spoken of, it has always been pronounced, and with great propriety, a good fruit. This fruit in size is a little larger than most of our grapes, remains longer in a state of eating, and when fully ripened in a favorable situation, the outward skin loses, in a great degree, its tough or leathery character, the pulp, which encloses the seed, changes into a more tender and liquid state, and the whole grape becomes a delicious morsel to be eaten, and enjoyed as most foreign grapes, or as the blackberry and raspberry, fruits so much esteemed by all. This fruit is rather oblong in shape, varying in color from what some would call a white to a flesh, and in some instances to a light purple or crimson. The vine is a good bearer, and in common years, with usual cultivation, the fruit will begin to ripen about the middle of September, and if not injured by frost, will continue on the vines till the middle of October, and perhaps later, and may be kept, if carefully gathered, through November. The committee venture to recommend this as a fruit worth cultivation, though not of that high character contemplated by the society in the offer of premiums. The chairman has a variety of this grape, which, in the opinion of many competent judges, is thought to possess qualities which give it a decided preference over the Haverhill grape.*

* The committee think it quike likely, that some of the grapes growing in the country, greatly resembling the Walker grape, have sprung from seed of this grape, scattered by birds and other instrumentality.

Diversity in the qualities of Grapes.—Grapes, like other fruit, vary in size, shape, color, time of ripening, length of time they can be preserved, adaptation to particular uses, and in many other circumstances. Those about to commence grape orchards, or to multiply or enlarge those already in existence, should have regard to this, and make such selections as will in the result prove most gratifying or profitable to them. There are now in the county, in process of cultivation, various kinds, from which selections might be made, which would secure a constant supply of fruit in a state of maturity and freshness, from the middle of August to the month of February, and in most seasons from an earlier to a later period.

Unproductive vines.—Vines raised from seed of the native grape, are very apt to prove staminate; these of course, produce no fruit, and are therefore rejected most generally by those concerned in grape culture. The committee, however, state, that from physical considerations, which they deem supported by sundry experiments, they are led to think that it is beneficial both for the strength and health of the vine, the perfection of the fruit, the richness of its flavor and quantity of the yield, to suffer some of these vines to occupy a place in the vineyard.

Cultivation and training the vine.—In the cultivation of the grape, it should be remembered that the tendency of the vine is to a luxuriant growth of wood. Its physical construction encourages this. The study of the vinegrower should be, as far as he can, to counteract this tendency and to turn the nutritious circulation from the wood to the fruit, and thus increase the size, but particularly the richness of it. In accomplishing this result, regard must be had to the character of the soil, the mode of trimming and training, and the nutritive ingredients applied to its roots. The committee would enlarge a little on these subjects were it not that it would unduly extend this report. As a general observation, they will say in respect to soil, that it should be sandy and warm, in preference to that which is clayey and wet. The manure used should not be of an active and exciting character. As a single article, no one is so universally good as the trimmings of the vines, and small branches of trees placed upon the earth about the roots, to the

extent of several feet. In places subject to early frost, training the vine near the earth, horizontally, is a safe practice, and where the air is particularly damp from any cause, training to an upright stake or pole, to the height of ten or more feet, has been found so obviously beneficial as to recommend this mode to the attention of all engaged in the culture of the grape. This last course is often beneficial, too, because, by the almost constant motion of the pole caused by the wind, the fruit will be protected from being scalded by the sun's rays, an injury to which it is very liable in many situations, and also to an encouraging extent from the baneful influence of the mould. For the same reason a common trellis, composed of rather flexible materials, is to be preferred to one constructed of timber, so firm as not to yield at all to the usual motions of the wind. The best fruit ever obtained is that which grows upon vines attached to the longest and most easily agitated limbs of forest or cultivated trees. The principle involved in this last observation applies with almost, or quite, as great force to other fruits, and suggests a consideration of a practical nature in relation to general pruning.

A leading question in trimming is the comparative advantages between heading IN and thinning OUT. The committee have been led to suppose that extremes here should be avoided. If headed *in* too much, the tree and limbs will be moved but slightly by the common winds. This will expose the bark on the trunk and large branches to be burned, and the fruit scalded, by our hot and dry summer sun. If thinning *out* be exclusively adopted, the wind blowing upon the wide-spread branches is apt to strain and split them, and often to loosen the bark, and to bruise, if not to cause the fruit to fall. Grapes, being a smaller fruit, will remain uninjured by an agitation which would destroy the apple, pear, or any of the large and heavy fruits, but still will often suffer if exposed to a violent motion. Trees of almost any kind, where they can be spared, afford, so to speak, the best trellis for vines, certainly, in cases where but little labor can be devoted to them.

But while the committee judge it well to make this statement, in respect of methods of cultivation, they would at the

same time say to all, who possess any love of fruit, or who have families that like it, take any method that pleases them, or which their friends, with or without experience, or books written expressly on the subject, are pleased to recommend, for in either way, in a very few years, even should the method pursued not be the most successful, it will result in a generous supply of fruit, and of a quality sufficiently excellent to afford great satisfaction in the use. If there be a tree that can be spared, set a vine beside it, and let it spread itself out upon its branches. If there be a wall or fence it will well answer the place of a costly trellis. If there be a rock upon which, to take an illustration from the Scripture, no one ploughs, let a vine cover it, and let no one neglect to cultivate, altogether, because he has not time or means to do it, in the most scientific and expensive manner. The example set by Daniel Rogers, in Newbury, is good. Some years since he set a vine, taken from the woodland, beside a large rock near his house. This vine soon spread out and covered the rock, and has produced bountifully. Two years since, when visited by the chairman of the committee, it was judged to have at least seven bushels of very good grapes upon its branches, and should it continue to increase as it has done for years past, there is no reason to doubt but double this quantity may often be gathered from it.

A little fruit is better than none, and that which the many may call indifferent, possesses excellences enough to justify the cultivation of it where better cannot be obtained. One fact is certain, that there are no grapes growing in our wild lands but are anxiously sought and eaten with avidity, nor any that are cultivated but will be thankfully received by all, if presented to them; none but will be purchased if exposed in the market, and we may add, none but what will be stolen if opportunities are discovered. From all which circumstances, the committee feel justified in saying, that, in the unprejudiced estimation of the community, the grapes of our own county are well worth cultivation, and that a much greater supply of them is required to satisfy the general demand.

GARDNER B. PERRY, *Chairman.*

Bees and Honey.

If the small number of hives and boxes offered is any indication of the extent to which the culture of the honey bee is carried in the county of Essex, the committee regret that so interesting and profitable a pursuit should be so much neglected by our farmers. There must be a vast quantity of honey that lies ungathered deep down in the sweet cups of the wild flowers, wasting its luscious sweetness upon the passing winds. There must be in our county, a very sparse population of

> "Sweet honey-sucking bees,
> That out of summer velvet buds
> Do bear away the pillage of the fields."

Just one hive, four boxes, and one glass globe, as samples of all the honey culture of this stout county of Essex, with a more dense rural population than can be found in any other county of the State! Why, do the farmers know that such honey as was presented to the inspection of the committee, is worth, at retail, twenty-five cents a pound, and is bought by wholesale buyers in the market towns at seventeen to twenty cents a pound? Do they know that a properly planned, properly made, and properly managed hive will yield from thirty to fifty pounds a season of just such honey, for which just such prices may be obtained? Do they once think that a dozen hives may be managed with almost nothing of care, and nothing of cost, after the first outlay! Why, "good friends, sweet friends," let us look at it a moment, in a practical and economical light. A properly made hive, of the right construction, one that shall save the lives of all "the little busy bees," as long as their bounteous Maker intended they should live, (for your committee are no friends to that cruel system of management, which kills the bees to get the honey—murder and robbery both combined,)—such a hive, of best stock and well painted, may be bought for four dollars and fifty cents. A new swarm may be bought and put therein for, say at a high figure, four dollars more. Throwing out of the account the fact that in a good season, from an early stock, you will get ten to fifteen pounds of honey, the first year of the swarm, over and above what the bees will need

for carrying them through their first winter, the hive and swarm will stand you, with interest at one year in the valley, at a risk of nine dollars at the opening of the next season of the purchase.

Here, then, is an investment of nine dollars, and what are the probable proceeds? We say probable, though the probability of the return is almost a certainty. The stock shall have wintered comfortably and prosperously, and have reached its second season in good case, good heart, and in goodly numbers, from a bounteous and fertile queen mother. Such a stock will gather, after filling up its own supplies for the next winter, say as a small figure, forty pounds of honey, worth as above stated, seventeen to twenty cents, sold to the wholesale dealer, and twenty-five cents if retailed for family supply. In the one case the proceeds are from six dollars and eighty cents to eight dollars, and in the other ten dollars. Not a bad business for our farming friends, is this, by any means. For it is at the rates of seventy-five, eighty-eight, and one hundred and eleven per cent, respectively, and a much better investment than any that can be made just now, in either rolling or woollen mills, or railroad stocks.

This report is not the place in which to publish an exact treatise upon the management of bees, or an essay upon bee-hives. And yet the opportunity should not be omitted of slightly glancing at the one, and of endeavoring to throw out some useful practical hints upon the other.

Everybody, certainly every farmer, knows, or ought to know, and if he does not, he will pardon us for telling it, that all naturalists and apiarians are agreed that the honey bee, *Genus Apis mellifica*, is of the Order *Hymenoptera*, or insects having four membranaceous wings. Of this genus, Linnæus has enumerated fifty-five species; the Dictionary of Natural Sciences, (Dictionnaire des Sciences Naturelles,) characterizes seventy, and Mr. Kirby, in his Monographia Apium Angliæ, has described two hundred and twenty, natives of England.* The domestic honey bee, belonging to what are called perfect societies of insects, and every association of bees supposes

* But one species is known in the United States, and that is the subject of our report.

three classes of individuals, the mother, commonly called the queen, the working bees, and the drones. There is but one queen in the hive, the mother, and as the instinct which God has granted indicates, the mistress of the swarm. By the month of January and February, in any given year, the population of a hive is reduced by death to its lowest point, for the life of a working bee does not extend beyond eight months, and the deposition of eggs by the queen mother to any great extent, is interrupted during the severe months of winter. About the beginning of March, it recommences, and increases during April, May, and June, to such almost incredible amount, that the sparse winter population of scarcely three thousand, is hurried up to twelve thousand, fifteen thousand, and twenty thousand and more. And every bee-keeper is aware, that during the swarming months of May, June, and July, a swarming hive is literally overpouring in numbers, and that for want of room and air, in the inside, they hang in countless clusters upon the outside front of the hive. This is *no sure indication of swarming*, but when a swarm does rise, in time of such crowding, the front of the hive is pretty well cleared of bees. Ten or twelve days more will replenish the population to such extent, that a second swarn is not unfrequently sent off. A third swarm sometimes succeeds, but is quite undesirable, as it will be rather small, and is too exhausting to the parent stock, exposing it to the attacks of that atrocious enemy of all bees, and pest of all bee-keepers, the bee moth, (Tinea mellonella.)

The mother bee is easily recognized by her long, taper body, short wings and slow gait. In ordinary hives, she is seldom, if ever, seen. Before depositing her eggs, she carefully examines the cell, by putting in her head, and if satisfied, she inserts the point of the abdomen, exudes an egg which clings to the side and bottom of the cell, by some adhesive substance with which it is coated. The cells for the reception of worker eggs are the common cells of the comb, those for drones are somewhat larger, and those for queen mothers, larger yet, thimble-shaped, and built, mouth downward, upon the edge of the comb. Of worker eggs, the queen deposits, say from twelve to thirty thousand, of drone eggs, from five hundred to two

thousand, and of queen eggs, not more than five to eight. As new queens are born, if swarming is desired and allowed, one leaves with the swarm, and those that remain, swarming having ceased, are supposed to be destroyed by the strongest remaining queen. We say one leaves, not specifying whether it be the old queen or a new-born one, as that is a point upon which apiarians are not agreed. To the queen mother, the bees seem to pay the greatest respect, and to take the most special care to preserve her life and health. She is indeed the life of the hive, and might, as our common mother was called by Adam, be called the Eve of the swarm, "for she is the mother of all living" therein.

> "She lives, and pours through all, the accordant soul;
> She dies, and by her death dissolves the whole."

The writer of this report has often seen and handled her, and when seen, within the hive, among the bees, he has seen that all the bees around her turned their heads towards her, and, if she stopped, they formed a sort of circle about her, while some fondled and licked her with their probosces, and some supplied her with food. She is very gentle in her disposition, *never uttering an angry word*, and can, only after the greatest provocation, and scarcely then, be induced to attempt to sting. Beautiful pattern for all her sex!

The life of the reigning, or queen mother, by a beautiful adaptation of Divine Providence to the wants of the community over which she presides, herself supplying her own faithful subjects, is prolonged to the period of four or five years. If she dies at such a time of the year, when there is no young brood comb in the hive, say in November, December, January, and possibly, February, the stock must inevitably die out and perish. But if she dies, or is lost, when there is young brood comb in the hive, then the worker bees, wisely provided with the appropriate instinct, take a worm, of three or four days old, which, under the ordinary operation, would have been a worker bee, and, by means wholly unexplained, convert it into a queen or mother bee. Of the fact there is not a doubt. As the man said in the fable of the chameleon, so the writer says, having

witnessed the operation, "I've seen, and sure I ought to know."

The subject is one of great detail, as well as of great curiosity, and would occupy too much space to be here discussed. It is true, that apiarians are at issue upon the modus, and give varied explanations, but the best authorities all agree, that when there is a loss of the queen at the time of a supply of brood comb, the workers can make good the loss. Our own theory is, that the workers are all *barren females*, the organs of generation not being perfected for the production of eggs; that on the occasion of the loss of the queen, these organs are, in the worker worm, selected by some mode and by some appliances known to the instinct of the bees, duly and suitably elaborated for the production of eggs. A difficulty is, and not a small one, that the form and size, and length of sting, are all, also, altered. As our excellent friend, Sir Roger de Coverley says, in the Spectator, "a good deal may be said on both sides of the question," and a good deal has been said, and written, and scolded, and we do not think it worth while to bother the Essex bee masters about the arguments. Let us be thankful for the thoughful, wise, and excellent provision of the bee's great Creator, and go on with our report.

We will then say a word or two about the great *aristocrats* of the hive, applying that much abused word to those therein who live on the labors of others, themselves furnishing neither capital, skill, nor work, and whose only office is to assist in propagating the race. A useful, necessary, and indispensable vocation it is, the committee are willing to concede, but they wish the drones had something besides, about which to employ their leisure moments—

> "Those moments of leisure,
> Not devoted to pleasure."—*Old Song.*

The drones, then, are, with the exception before specified, the regular do-nothings of the hive; your fine gentlemen-at-large, and very portly and well fed gentlemen too. "They toil not, neither do they spin; they lay not up in garners;" they add nothing to the common stock, and yet, like some animals that go about on four legs—like some noisy fellows of the

genus homo—they make more noise and fuss, than all the rest of the tenants of the hive put together. Like furious orators on town meeting days, and at political caucuses, they keep up a miscellaneous kind of bother and buzz, with the intent, very likely, to make up in noise, what they lack in sense, and to draw upon their inflated selves the eyes of the "dear people," upon *whose honey they feed*, though contributing nothing thereto. With both these classes, as Tony Lumpkin says, "It's all buzz!"

They are an idle, cowardly, inactive, lazy, and clumsy set of fellows, and it is well that they are stingless, for it is serious matter of doubt, whether, if they had one, they could get up spunk enough to use it. Their life is a short and merry one, scarcely reaching beyond the brief period of three months, by which time, being of no further use in their *peculiar vocation*, they are all cast out, and killed off by the workers. Behold the picture of the life and death of your lazy, pot-bellied, ease-loving drones:—

> Their short proboscis sips
> No luscious nectar from the wild thyme's lips;
> From the lime's leaf, no amber drops they steal,
> Nor bear their grooveless thighs the foodful meal;
> On others' toils in pamper'd leisure thrive,
> The lazy *fathers* of the industrious hive.*

Such being the drones, the committee dismiss them from further consideration, proceeding to the more grateful subject of the

Worker bees.—These constitute the great mass of the population, being, as we have before hinted, unproductive or barren females. By them all the varied labors of the hive are carried forward. They are shorter and less in size than either the queen or the drones. Taking the queen at one inch in length, which is about right, the drone is two thirds and the worker one half an inch in length. The number of working bees in a healthy hive, may be safely put at from twelve thousand to twenty or thirty thousand. And in non-swarming hives, (such as have been in successful use by the writer, to which further

* From an unfinished poem, called "The Bees," by Dr. Evans, of England.

reference will be made,) there have been, beyond question, as many as forty-five to fifty thousand. When in such numbers, and carefully attended to, in the matters of *room* and *ventilation*, the united labors of so numerous a body of workmen, or rather work-bees, are productive of magnificent mountains of high-piled sweets. The writer once owned a non-swarming hive, which he kept in a garden in Salem, and which consisted of three collateral boxes. At the end of the second season from its being tenanted by the bees, each side box contained about forty-five pounds of honey. Both these were taken away, and there was left in the central box, where the bees domiciled, fifty pounds for their winter use. To return to the workers. They are all provided with a flexible apparatus, called a proboscis, with which they *lap up* the honey, for they are a lapping, not a sucking insect—Shakspeare to the contrary, notwithstanding, who says in the Tempest,—

"Where the bee sucks, there lurk I."

They also have, upon their thighs, small, hollow baskets to receive the farina and propolis which they gather, in great, and seemingly unnecessary quantities, from the flowers and the leaves.

The working bees have, further, a honey bag, in shape like a tapering oil flask. This, when full, is about the size of a small pea. The honey which it contains, is in part, delivered up into the honey cells of the hive, for winter use, in part, goes into the general system of the bee for its nourishment, and a portion is converted into wax, which is afterwards exuded in scales, between the rings of the abdomen. For their personal defence, and the defence of their home and hive, and its right precious contents of queen, and young, and honey, they are furnished with a most powerful sting, in the use and application of which they are eminently apt, as your committee have had pungent experience, and can testify thereto. This sting is complex and two-fold, being a horny scabbard, enclosing two bearded darts, along the groove between which, is ejected a venomous fluid acutely poisonous. This poison is a chemical acid, which may be neutralized and rendered harmless, by the

early application of any alkali, such as pearlash, or saleratus, dissolved in warm water. The bee seldom stings, except about home, and here its watchful jealousy against intruders, keeps it constantly "primed and loaded," and ready for fight. Yet, if they get wonted to the visits of the keeper, or to frequent visitors, they are much less apt to sting, than if left wholly unused to such visits. In fact, if visited frequently, by persons who move about the premises carefully and quietly, and who are cleanly in their habits, and have no peculiarly strong human odor, and who are careful not *to breathe upon them*, they are, on the whole, a tolerably peaceable and gentlemanly crowd. Never strike at them; never breathe on them; never go near them when in, what the refined lady in the "Vicar of Wakefield" called, "*a muck of sweat.*"

Just hear what old Butler says, who wrote on bees more than two hundred years ago:—"If thou wilt have the favor of bees that they sting thee not, thou must avoid some things which offend them; thou must not be unchaste and uncleanly; for impurity and sluttishness, themselves being most chaste and neat, they utterly abhor; thou must not come among them smelling of sweat, or having a stinking breath, caused either through eating of leeks, onions or garlick; thou must not be given to surfeiting or drunkenness; thou must not come puffing and blowing unto them, neither hastily stir among them, nor resolutely defend thyself when they seem to threaten thee; but softly moving thy hand before thy face, gently put them by; and lastly, thou must be no stranger unto them. In a word, *thou must be chaste, cleanly, sweet, sober, quiet, and familiar*, so they will love thee, and know thee from all other." (Butler, chap. 1, part 33.)

For safety in operating among them, it is prudent, if the apiarian has any fears, to smoke a pipe or cigar. With tobacco smoke, you may drive before you, "a whole wilderness" of bees. Their detestation of the nauseous weed is truly exemplary.

There are very many excellent bee-hives, patented and unpatented. We shall not discuss their various merits, but shall only point out such principles in their general make, as shall

secure the management we desire to see carried out. This management is to have for its distinguishing feature, *the preservation of the bees from the cruel, unnecessary, improvident and heartless destruction by sulphureous fumes*, to which so many farmers and apiarians doom them, for the sake of getting their honey. Murder and arson, and robbery, all combined! How feelingly Thompson laments this barbarous usage in the "Autumn" of his "Seasons!" (Line 1170 et seq.):—

> "Ah, see, where robbed and murdered in that pit
> Lies the still heaving hive! at evening snatched,
> Beneath the cloud of guilt-concealing night,
> And fixed o'er sulphur! while, not dreaming ill,
> The happy people, in their waxen cells,
> Sat tending public cares;
> Sudden, the dark oppressive steam ascends,
> And, used to milder scents, the tender race,
> By thousands, tumble from their honied domes!—
> —Into a gulf of blue sulphureous flame."

This destruction, the committee say, is wholly unnecessary, as well as cruel, and they intend to substantiate the assertion, by showing the bee-keeper, that, if he considers it necessary to dislodge the bees from a hive that he may take the honey, *there is provided by nature, a means of doing it, without destroying the life of a single bee.* The means referred to will be discussed before closing the report.

A properly designed and well made hive should have a movable bottom-board, collateral boxes, and an upper chamber in addition. With such a hive, bees may be successfully kept, and made to yield a handsome profit to the keeper, from the sale of their superfluous honey. Not a life need be sacrificed, and the honey taken will be considered but a fair rentage paid by the bees for the use of a comfortable home and hive; a home and hive, in which, from its proper construction, they are equally protected from the excessive heat of summer, (and therefore can work the better, and without idlers piled upon the outside,) and from the severe cold and varying temperature of winter. They will also, by means of the chamber, be kept free from that dampness and mould, which, during the

winter, causes the destruction of so many stocks. With such a hive, the apiarian may permit or prevent swarming, just as he pleases.

We will now give the description and dimensions of a hive, constructed with the above principles in view. Such a hive was successfully used by the writer for very many years, in the city of Salem. It is not patented, and no hive ever should be, and the committee are glad to know that the granting of patents on hives will meet very little encouragement at the Patent Office in Washington. It is not wholly an original hive, but its several points have been made up by careful examination of the descriptions of the best hives known here and in England, by actual practice with a great variety of hives, and by diligent study of what appeared to be capable of meeting the wants and suiting the habits of the dwellers and workers in hives. Any hive is a good one which is constructed on the principle of humanity to the honey-bee, and your committee speak of this, not with the intention of saying, that it is "the best that was ever made," to use a common phrase, but simply to say that it is a good one, and will answer a satisfactory purpose; that it is not complicated nor costly, and can be easily managed. They say to the bee-keepers of the county, "*save your bees, by using such hives as will enable you to do so, and at the same time, give you a fair percentage of their labor.*"

Many such hives are in use in our county. Perley King, of Danvers, Mr. Bodwell, of Lawrence, Rev. G. B. Perry, of Groveland, and very many others, whose names do not occur to us, use such hives, and we wish their use was universal.

The hive we propose to describe consists of four parts, viz: a bottom board, a centre hive, and two collateral boxes. These will be described separately. The stuff of which all the parts are made, is to be of the best stock, well seasoned and free from knots and from shakes. The *thickness* of the stock mentioned, is in all cases, what it is after being planed down and smoothed off and ready for use, and the other dimensions are all *inside measure*. We may as well mention here, that it is intended that these hives should be placed under some con-

venient kind of house, open to the south, and sheltered from the sun and the storm.

1st. The bottom board is made of one-and-a-half inch stuff, and is bevelled at its front edge, so that the upper side, on which the hive rests, is fourteen and one half inches wide, and the bottom is fifteen and one half inches wide. The object of the bevel is, that the rain which may beat against the front of the hive, may easily run off. The length of the bottom board is thirty-one inches, inclusive of a stout cleet at each end, to prevent warping. In the front centre of it is the door-way for the bees to enter and leave, six inches long, and three-eighths of an inch high. This commences at the lower front bevel edge of the bottom board, and slanting upwards and inwards, opens out into the hive, just within the *inside* of the front board of the hive. This *inner* opening of the door-way is made rather full and spreading, so as to give room for the bees entering with their loads, to separate easily in the several directions into which they may happen to take their supplies. It is made small at the outside, so that the bees may the more readily be able to defend themselves against their enemies.

2d. The central and main hive is twelve inches by twelve inches in area, and is twenty inches high, reckoning from the upper side of the bottom board on which it rests, to the underside of the top cover, which top cover, made of seven-eighths stuff, is just so much larger than the central hive as to allow a projection three quarters of an inch all round. This top must be firmly nailed on, driving the nails a little slanting, to get a better hold. The twenty inches height of this central hive, is divided into two rooms, by a seven-eighths piece of stuff, through which six holes, one inch bore, are made, to lead from the lower to the upper room, and over which holes,* large pint tumblers or boxes may be placed for the bees to build in. What they may here deposit, you may take for rent any time when full. The upper room is nine, and the lower room is ten and one-eighth inches high. The inside and roof of this lower room must *not be planed too smoothly.* A little roughness

* Keep these holes open in winter, and tumblers over them, to collect the steamy moisture, which, rising from the bodies of the bees, often proves destructive to the stock.

assists the bees in securing their comb. Do not put any sticks across this room; they will be in the way, if you should at any time wish to take out old comb, to let the bees replace it with new, and they are of no use whatever. The back and front boards of this central hive are one and one half inches thick, and have in them openings, six inches by four, and glazed, looking into the *lower* room, to give the keeper a chance to see what is going on. These are to have covers closely fitted in. The back board reaches only to within *a quarter of an inch* of the *upper* side of the partition board, which is between the lower and upper rooms, this upper side being, of course, the floor of the chamber. This falling short leaves a rabbet against which the back door of the chamber, *which is one and one half inches thick, and is made of the full size of the chamber*, may rest. The sides of the central hive are of seven-eighths stuff, twelve inches wide, and twenty inches high. In these sides are cut slits, or passage-ways for the bees, through which they pass from the central to the side boxes, to be described directly. These slits are cut, one out of the bottom of the side-piece, and one at nine and one half inches from the bottom, and one just half way between these two. They are seven inches long and five-eighths inch high. By this arrangement, it will be seen that the top of the upper slit of the three, is just even with the top of the central hive. Out of the inner back edge of those parts of these side-pieces, which make the sides of the chamber, rabbets are also cut for the purpose of supporting the back door above spoken of. A door may also be cut, if you choose, out of the upper part of the front side of the central hive, to enable you to examine and take out the front glasses, without disturbing those in the rear. If this be cut, rabbets must be left to support the door.

3d and 4th. The collateral or side-boxes are each ten and one-eighth inches high, six and a half wide, and eleven inches from front to rear, made of seven-eighths stuff. The side that is next the central hive, projects one-half inch to the front, and the same to the rear, coming flush with the front and rear of the central hive, and so giving space for the reception of screws by which to secure it to the central hive. Cleets on

the bottom board, placed in front of these side-boxes, where they fall back from the bevel edge, keep the whole hive firmly in place. Through this same side, slits or openings are cut to correspond with those already cut in the central hive. Let the inside of these boxes be only *tolerably smooth.* Out of the front and rear, cut holes four by four inches, and glaze them, through which to see what is going on. There must, of course, be proper covers for these holes. These and all other openings *must be kept shut*, excepting when you may wish to take a look, as bees prefer to work in the dark. The top cover of the side-box is to project on each side, excepting where it joins the central hive, and here it is to be flush. Through the centre of this cover, cut a hole four by four inches, and sink down into it, flush with the top, a piece of tin or zinc, *perforated abundantly with small and smooth holes.* Over this, have a slide cover, to open and shut at pleasure. This tin is to let out the hot air from the side-boxes, and consequently, from the central hive, and to prevent the bees, by this ventilation, from clustering and idling on the outside, and to control their swarming. With proper ventilation and the giving of room enough to work in, you may prevent your bees from swarming, and keep all hands constantly, and therefore profitably at work, and this is *a most important feature in bee management. Do not by any means neglect it.*

These perforated tins should be kept open. during the great working season, say from the middle of May to the middle of July, and if the bees fill them up, be sure to open them out again, by carefully inserting an awl or stout needle.

During the first season in which a swarm is put into this hive, it must be confined to the lower room of the central part. If the season is so favorable that they fill this room completely, they may be allowed to go up into the tumblers or boxes, in the upper room, or into one of the side-boxes. To command the passage-holes leading to the tumblers, strips of tin must be procured, say two inches wide and twelve inches long, turned up a little at one end, so as to give hold in drawing them out. When shut over the holes, small tacks will hold them, and *they must be shut when you are getting your swarm in*, or

the bees will go into the upper room and cause trouble. The lower room is the principal home. To command the slits, or passages into the side-boxes, a sheet of tin, of proper size, is the most convenient. When the second season opens, the bees may be allowed full admission to both side-boxes, and to all the tumblers. Spare bits of honeycomb put into the latter, will be very useful, as an inducement to the bees to commence working in them. These tumblers, when full, may be taken off at any time. Hold them mouth upwards, and the bees will soon leave, and you may feast upon the fresh honey at your own table, or send it as a comfort to a sick or needy neighbor. As to the side-boxes when full, the writer has always preferred to let them remain, till some cold morning in October, when it will be found that the bees will be all clustered into the central hive for warmth, and you may quietly unscrew the side one, and take it away. No bee will be there. How vastly preferable is this management to murderous assault by fire and fagots, and sulphureous fumes of choking brimstone!

Your hives should be all made up and most thoroughly painted, and the paint well dried, some weeks before needing them for swarms. It will be well to keep a swarming hive or two, wherewith to stock your "*non-swarmer-hives*," such as are described above. We apply no such laudatory phrases as "best," "most perfect," "surest," "incomparably superior," to this hive. We merely say it has always done good service.

We will now point out the means by which the bee-keeper may stupefy his bees, without killing or hurting them; how he may, while they are thus stupefied, transfer them all from their own hive, leaving him the honey, and unite them to another stock, with which they will pass the winter, and by the opening of the spring, give the owner a strong and vigorous colony, which will either throw off strong and vigorous swarms, or, if the bee-keeper prefers, will keep at work in the thus doubled hive, and greatly increase the make of honey. It must be borne in mind, that the hive we have recommended and described, is, *if the bee-keeper choose so to manage it, a non-swarming hive*, though he may let it swarm or not swarm, at his pleasure.

There grows in the old damp meadows, horse pastures, and

in other localities all about the farms, a sort of mushroom, varying in size from a human head to a Shanghae's egg, which is variously called Puck, Puffball, Frogcheese, and Fungus, and by naturalists, Fungus maximus, or Pulverulentus, and Bovista lycoperdon. The fumes of this, after it has been dried, are narcotic, and will so stupefy the bees, that they will tumble down from out of the hive, and remain dormant from one or two hours, during which time they may be handled with entire impunity.

An old English bee-master, John Thorley, who wrote in 1774, after, as he says, "forty years' experience," thus describes the preparation of the fungus for use:—"When you have procured one of these pucks, put it into a large paper, pressing it down therein to two thirds or one half its bulk, tying it up very close. Put it into an oven, some time after the household bread is drawn, letting it continue all night. When it will hold fire, it is fit for use." For the purpose of fumigating the bees, and stupefying them, a small sheet-iron box must be procured, in size between a pepper-box and a flour-dredging box, and having a cover to fit on rather tight.* From one end of this there should extend a tube, about eight inches long, and one-half inch bore, bent upwards at its upper end, so as to be inserted into the door of the hive; and from the other end, another tube about six inches long, and of such size as to fit snugly upon the nose of a common bellows. Having the box and the bellows all ready, cut off a piece of the fungus about as large as a hen's egg, put it into the little box, set it on fire, shut the box, and put the six-inch end upon the nose of your bellows, insert the curved end of the other tube into the door of the hive, shut all other openings, if there be any in the hive, and blow away!

> Blow, bellows, blow,
> For you must know,
> That all this smoke,
> The bees will choke.—*Old Song.*

—almost choke, not quite, for it is only a brief intoxication, which will do no harm. In a few minutes, after a buzz or two,

* Brown's Patent Fumigator is excellent for this purpose.

you will hear the bees come toddling down, like drops of hail, and they will lie upon the bottom board of the hive as harmless as "sucking doves." Give the hive a few gentle taps on its top and sides, to shake them all down, and remove it, stripped of its bees, away from the place of your operations. Take it to the house or barn, and put it into a dark room, where robber bees cannot get at it. Now, after sprinkling your tipsy bees with a very little honey, take another stock and put it over them. Fumigate this second hive, though not quite so much as the first, and leave it, after closely wrapping it round with wet cloths to keep *out* all outsiders, and to keep *in* all insiders. By the next morning, you will find a *coalition* formed, and the two parties getting along quite comfortably. Keep them confined, *though not wholly without air*, all the next day, and at evening of the second day, take off the coverings and open the door of the hive. The bees may rush out, but will soon return and all will be quiet. As to which queen shall be retained to be the mother, give yourself no trouble, the coalition will settle that knotty question for themselves. It will be best for the operator to have an assistant, and the whole success will depend upon expertness, coolness and fearlessness. If you cannot procure the fungus, take common blotting paper and dip it into a solution of nitre, (a tea-spoonful to a pint of water,) and after saturation, dry it by a fire. The fungus has often and successfully been used by the writer; the solution of nitre is given on the authority of others.

The united bees will get through the winter better than a single stock. In fact, Gelieu, a French apiarian, carried the uniting of stocks to the extent of joining four stocks to a fifth, and the united stocks consumed but little more honey than an ordinary single stock! By this method you save your bees, and at the same time get the honey. You may strengthen a feeble stock, or if your neighbor wants to "take up his bees," to get honey *in the old way*, persuade him to let you "take them up," *in this new way;* restore to him his hives and the honey in them, and join the bees to your own stocks, all, of course, with his leave! Is not this better than fire and brimstone?"

The writer has usually employed a box of the size of the

hives, and four inches deep, to catch the dropping bees. This box had a hole two or three inches square, cut into each side. Into two opposite ones, he put a piece of glass that he might see what was going on, and into the other two opposite ones, a piece of tin, perforated with small holes to admit air after fumigation. These last must, of course, be stopped, while the smoke is being blown in. *This operation must be performed just at night, when the bees are all at home, and at some time between the middle of August and the middle of September.*

We add a few words respecting the enemies of bees. The mouse, the toad, the ant, the stouter spiders, the wasp, the death-head moth, (Sphinx atropos,) and all the varieties of gallinaceous birds, have, each and all, "a sweet tooth," and like, very well, a dinner of raw bee. But the ravages of all these are but a baby bite to the destruction caused by the bee moth, (Tinea mellonella.) These nimble-footed little mischievous vermin may be seen, on any evening, from early May to October, fluttering about the apiary, or running about the hives, at a speed to outstrip the swiftest bee, and endeavoring to effect an entrance into the door way, for it is within the hive that their instinct teaches them they must deposit their eggs. You can hardly find them by day, for they are cunning and secrete themselves. "They love darkness rather than light, because their deeds are evil." They are a paltry looking, insignificant little grey-haired pestilent race of wax-and-honey-eating and bee-destroying rascals, that have baffled all contrivances that ingenuity has devised to conquer or destroy them.

Your committee would be very glad indeed to be able to suggest any effectual means, by which to assist the honey bee and its friends, against the inroads of this, its bitterest and most successful foe, whose desolating ravages are more lamented and more despondingly referred to, than those of any other enemy. Various contrivances have been announced, but none have proved efficacious to any full extent, and we are compelled to say that there really is no security, except in a very full, healthy and vigorous stock of bees, and in a very close and well made hive, the door of which is of such dimensions of length and height, that the nightly guards can effectually protect it. Not

too long a door, nor too high. If too long, the bees cannot easily guard it, and if too high, the moth will get in over the heads of the guards. If the guards catch one of them his life is not worth insuring. But if the moths, in any numbers, effect a lodgment in the hive, then the hive is not worth insuring. They immediately commence laying their eggs, from which comes, in a few days, a brownish white caterpillar, which encloses itself, all but its head, in a silken cocoon. This head, covered with an impenetrable coat of scaly mail, which bids defiance to the bees, is thrust forward, just outside of the silken inclosure, and the gluttonous pest eats all before it, wax, pollen, and exuviæ, until ruin to the stock is inevitable. As says the Prophet Joel, "the land is as the garden of Eden before them, and behind them a desolate wilderness." Look out, brethren bee lovers, and have your hives of the best unshaky, unknotty stock, with close fitting joints, and well covered with three or four coats of paint. He who shall be successful in devising the means of ridding the bee world of this destructive and merciless pest, will richly deserve to be crowned "King Bee," in perpetuity, to be entitled to a never-fading wreath of budding honey flowers, from sweetly breathing fields, all murmuring with bees, to be privileged to use, during his natural life, "night tapers from their waxen thighs," best wax candles, (two to the pound!) to have an annual offering from every bee master, of ten pounds each, of very best virgin honey, and to a body guard, for protection against all foes, of thrice ten thousand workers, all armed and equipped, as Nature's law directs. Who shall have these high honors?

HENRY K. OLIVER, *Chairman.*

Moody Ordway's Statement.

The hive of bees which I present for inspection, is a specimen of fifteen hives in my apiary. The construction and dimension of this hive, I consider superior to any that I have ever seen, and are as follows: Length on the back side two feet, front two feet three inches. This slant on the bottom enables the bee to drag out all dead bees, and filth, easily.

Width eleven inches and a half, (this width I choose on account of my glass; I buy ten by twelve, and cut it in the middle which answers for half hives,) breadth one foot two inches; these dimensions are, in the clear, seven inches and a half from the top; it is separated for the top box: under this is a little shelf, four inches deep and four inches wide, for two small boxes which hold about two pounds each; these are very handy and convenient, in case you want to draw a small quantity for a sick friend, or for a luxury. Under this shelf, is a glass five inches wide, which looks into the body of the hive. The bottom is put on with butts on one side, and with small wire hasps on the other, and a two-inch wood screw in the centre behind. In the centre of the hive, I have a piece four inches wide, half an inch thick, firmly secured to the centre piece, running down within the reach of the bees, at the bottom, for a direct communication with the upper box, and stay to the comb, which I find is all that is necessary.

There are two passages to the large box, one four inches long and half an inch wide; the other, two and one half inches square, next to the back shelf. These holes should be in the centre, and on a line, that the communication may be cut off with one piece of zinc or tin. The holes into the small boxes should be two inches square. On the back part of the hive there are two doors, one hung at the top, and the other at the bottom, and both secured with one button in the middle. My hives and boxes are all made of uniform size, so that any box will suit any hive. The boxes are fixed with glass in front, slipped in a groove, cut on each side, so that I can ascertain the amount of honey, and the condition of my bees, at any time. On each side of the hive, (at the bottom of the lower door behind,) are pieces firmly nailed to the hive, one and a half inches wide, and half an inch thick, projecting out four inches before and behind, which answers for handles to carry them by, and by which they are suspended. At the entrance in front is a slide door made of zinc, and perforated with holes which I can shut at any time, and is very convenient in many instances. My hives are suspended by stout wire, (No. 7, I think,) fixed to the handles before mentioned, and running through a groove

in the top of the hive, (the top projecting out a little all round, except behind,) and hitched to staples in rails about five feet from the ground, the top of the hive five or six inches from the rails. Over this stand is thrown a shed, (which has no connection with it,) boarded to the ground on the back (north-west,) side, but far enough from the hive for a passage between. Hives about one foot apart on the stand.

I have been thus particular with regard to my hives and stand, for this reason: I have been very successful for six years, and I can attribute it to no other cause than a "good rig." I think very much of this mode of suspending the hives; it is calculated to keep them clear from all vermin, which like bees much better than they like them.

I have had seven new swarms this year, and have taken from nine swarms two hundred and eighty-five pounds of honey, reckoning thirty pounds in the hive which you see.

My mode of management when they swarm, is to let them alight, cut off the limb, put them on a table, or board, set the hive on them, put a quilt over them, and leave them to go up themselves; and I never have lost a swarm when I have done so. I have tried to "manage" a little with bees, but with little or no success. I think the best way is to look to them often, keep them clean as possible, and let them "manage" for themselves.

With regard to the moth, I am inclined to think there is no possible way to keep them clear from the bees; I am troubled, however, but very little with them.

West Newbury, *Sept.* 24, 1851.

Eldred S. Parker's Statement.

I offer this honey, two boxes, for premium. I purchased a swarm of bees of Rev. Dr. Perry, the 20th of June, and hived them that evening in one of Breck's patent hives. They went to work immediately, and in a fortnight had filled the lower part of the hive; then I let them into the upper boxes, which they filled so that I removed them the 31st of July, replacing with others of the same size. The boxes which I present for your inspection, weigh each twelve pounds. The hive

is placed in a chamber over a wood-house. It is now full of honey, forty pounds or upwards. This is my first attempt at keeping bees.

I sowed a small piece of buckwheat for them, this fall, but they have lived principally upon the white honey-suckle, of which there has been a great quantity the past summer.

Groveland, *Sept.* 23, 1851.

Communication on the Michigan Sod Plough.

On the day of our ploughing match, one of these ploughs was operated on the field and attracted much attention. It turns two slices at the same time, laying one upon the other. Having seen similar ploughs operated at Dedham, at Taunton, at Amherst, and at other places, uniformly with approbation, and having heard some query expressed, as to the power of team necessary for their movement, I determined to give them such a trial as to satisfy myself, at least, of their value. Accordingly, I wrote to Mr. Prouty, the proprietor of this plough in Massachusetts, to send me *two of best structure*, so guaged as to turn a furrow slice ten inches wide, and eight inches deep —the sod part three inches, and the under soil five inches. This was done; and on Tuesday last, they were put in operation, with a team of two pair of cattle, in presence of several persons, who had strong impressions against the utility of the plough. It was tried in every form thought desirable to test its merits. It was compared with one of the best Eagle Ploughs, Ruggles & Co. The work was continued until each gentleman present had an opportunity to hold, until he was satisfied. The result was, that each and all expressed their opinion, that the plough was a decided improvement on any ploughs they had ever seen; and that it would be found of great value, for many uses on the farm. William R. Putnam, who assisted in operating the ploughs, says:—"My impression when I first saw the plough was, that it might pulverize the soil well, but that it would require more power to operate it than a common

plough. But in the practical operation of it I was disappointed. It appeared to work as easy for the team as the common plough, and easier for the holder; in fact, it almost held itself, one part balancing the other. I saw it move many rods accurately, without any guidance. I could not at first see how it was possible for it to move so easily as the common plough. But I think I now understand how the extra power required to draw the small plough, is counterbalanced, by the ease with which the furrow slice is inverted, after it is split in two parts. We know that two boards will bend much easier, and support less weight than a plank of the same thickness from the same log. May not the same principle be applied to turning the furrow slice? I think that any one who witnesses the operation of this plough, will notice that it rolls the furrow slice over much easier, than does the common plough. If upon trial, it shall be found to work as well as when I saw it upon your brother's field, I think it will prove a useful invention."

I have ventured to give the opinion of Mr. Putnam, rather than my own, because where he is known, his judgment will be valued as high as that of any other practical man in this vicinity. My brother assures me that he fully concurs in this opinion—although at first, his impressions were not favorable to the plough.

I am well aware that we are in danger of being captivated by *new things*. Such was the case, to some extent, with "Bartlett's Double Plough," which, meteor-like, flashed upon us, and vanished away. Nevertheless, great improvements have been made within the last *thirty years*, in the structure of the plough; and if I do not mistake entirely, this will be found among the most valuable of the improvements that have been made. I do not suppose this plough will be adapted to every kind of work Its peculiar use is for the breaking up of cultivated grass land; land from which the fast rocks have been removed, as they should be from all cultivated fields. The farmer, who, year after year, worries himself and his team, by ploughing over fast rocks in his field, thereby makes a mistake. It would be much better to remove them at first, whatever may

be the labor required, than to continue to plough about them or over them. How this plough will operate in old ground, I have not witnessed; but my belief is, it will do well, and greatly facilitate the minute pulverization of the soil, which is the grand purpose of ploughing.

J. W. PROCTOR.

DANVERS, *Nov.*, 1851.

MIDDLESEX AGRICULTURAL SOCIETY.

The annual exhibition of the Society of Husbandmen and Manufacturers, in the County of Middlesex, took place at Lowell, on Wednesday, the 24th of September last. For more than fifty years, the shows of this Society have been held in the ancient town of Concord. At a meeting of the Trustees, it was their opinion that a more general interest in the subjects proposed to be promoted by the society, might be excited among the farmers of the county, by holding the show this year at Lowell.

For the ploughing match, twenty two teams were entered: Eight double teams of four oxen each; four horse teams of two horses each, and ten single teams, of a pair of oxen each. The ground selected had the merit of being near the cattle pens, as somewhat uneven and stony, but afforded pretty fair average lands for all the competitors. The ploughmen exhibited great skill in the use of their implements, in avoiding stones, and in the nice movements and changes of the plough in passing uneven places, in order to leave a smooth and workmanlike furrow behind. So much mind has been brought to act upon the plough and its uses, within a few years past, that this very important part of husbandry—ploughing, may be performed now at one half the expense which it cost fifty years ago. Not only is the work done cheaper, but it is believed that the increase of crops occasioned by deep ploughing, more than pays the cost of extra labor. Then, a depth of four and five inches was considered sufficient, while now the intelligent cultivator requires double that depth on stubble grounds, and a subsoiling of five or six inches deeper, when the sward is broken up.

Thirteen entries were made for the trial of strength and skill of working oxen, but seven teams only appeared on the ground. The load and waggon, weighing *eighty-five hundred and twelve pounds*, was drawn a distance of about forty rods, up a moder-

ate hill, with steadiness and apparently without straining, by several of the teams. The teams were exercised in all the various movements of the road, drawing, stopping and starting, backing and turning, and proved themselves to be under most excellent discipline; several of the cattle engaged in this exercise were very large, of beautiful symmetry, quick in their motions, and of great strength, and would bear a favorable comparison with cattle from any part of the State.

The show of cattle was large in numbers and excellent in quality, but upon the whole, not coming up to what the farmers of Middlesex can make, if they would exhibit more of their stock. In this county there are several towns, which have associations and exhibitions similar to our own, and *they* appear to be a sufficient outlet for the zeal of most of the farmers in those towns. Consequently their stock and other articles suitable for exhibition, do not appear in the annual county show. In this respect, it is believed that the establishment of town societies operates injuriously to the county societies. Frequent meetings of the farmers of a neighborhood or town, for discussion and comparison of farm operations, would no doubt lead to many beneficial results. But it is believed that the multiplication of town societies, holding annual exhibitions, may withdraw attention from the county associations, weaken the interest felt in them, and finally defeat the object which the State had in view in contributing to their support.

Among the cattle were several specimens of native cows, possessing most of the best points, and giving strong indications that with proper attention to the sire, these animals would produce progeny of a very high order. The weight of one of these cows belonging to Alexander Wright, of Lowell, we were informed, was 1400 pounds. There were also fine cows of the Ayrshire, Alderney, Durham and Devon breeds.

Of swine there were a few fine specimens, comprising nearly all that were shown. Notwithstanding this deficiency in the exhibition, there is really a good deal of attention paid to improving the breeds of swine. A large number are kept in the county as the best means of increasing the manure heap. These are principally fed upon milk and corn, and furnish as good pork as can possibly be produced.

The exhibition of fowls was very fine. All the kinds common to New England, as well as all the imported varieties which have become familiar to us, were on the ground in large numbers. Much attention is paid to the rearing of poultry in this county, and it is hoped that some means may be suggested of ascertaining its annual value hereafter.

With considerable experience in the rearing and management of poultry and from having kept accurate accounts of the expense of producing it among the several varieties, there are no doubts remaining with us that the best sorts which have been common in New England for the last twenty-five years, are the most profitable both for eggs and flesh, and command a higher price per pound in the markets in this State, than any other. To be made profitable here, chickens must be brought out early and sent to market in July and August. They then bring a higher price per pair than they will in September and October, or even later. Hatched out in March or early in April, kept in warm, sunny places and plentifully supplied with proper food, our common varieties come nearly to maturity by that time; are fat, plump and tender, and bring in the Boston market, from seventy-five cents to one dollar twelve and a half cents per pair. At this rate poultry may be raised to a profit in Middlesex county.

The larger varieties seem to us fitted and designed for warmer climates. In our experience we have found that it requires some eighteen months to bring them to maturity, by which time forty or fifty cents a pound would not be too much to pay their cost of keeping. In the southern States, where they could have an extensive range over the stubble of wheat fields, or could feed at pleasure about the stack yards, they might prove a profitable variety.

That the farmers in the county feel a very general interest in this pleasant anniversary, was manifest by the large numbers that attended upon it. The influence of such gatherings must be beneficial. It stimulates competition in the various modes of husbandry and production of crops, brings the people of different towns together to relate their experience, compare their stock and kindle a generous enthusiasm and kindly neighbor-

hood feeling among them. They gather new ideas and encouragements, and in turn impart them to others. On the whole, we believe the operations of the society are diffusing a beneficial influence in the county.

The address before the society was delivered by Hon. Linus Child, of Lowell.

E. R. HOAR, *President.*
SIMON BROWN, *Secretary.*

Farms, &c.

There were five farms, three bog or peat meadows, and eight apple orchards entered for premiums; a much less number of entries than usual, but the committee, in the discharge of their duty, have travelled from nearly one extreme of the county to the other. We were cordially received by our brother farmers, who gave us substantial proof of the interest they take in our welfare.

The committee could not but observe the great change that has occurred almost everywhere, as regards the men who do the labor on our farms. The sons of our farmers are looked for in vain upon the farm. We find in their place *foreigners*, to help the father in the ordinary business of the farm. Is this as it should be? Is it certain that our young men who leave the paternal roof to seek a better living, are sure of obtaining it? Does not the cultivation of the earth afford as many substantial comforts and blessings as other pursuits? The committee have no hesitation in saying that they think it does, and they regret that they do not find more of our young men engaged in that calling, instead of resorting to our cities and large towns for a fancied easier mode of subsistence.

But the committee saw much to gratify the eye and encourage the heart. Our farmers are determined to go ahead, if the boys *will* go away, and their motto is improvement. Their buildings are kept in repair, stone walls are rebuilt, rocks blasted and unproductive swamp lands reclaimed. The time has gone by in which the farmer asks for the old paths. He now wishes

to learn the shortest and best road by which he can have a better farm and reap a more abundant harvest than his neighbor. Rejoice then, ye who cultivate the soil, and be grateful to all bounteous Heaven, for your distinguished blessings.

The farms examined by the committee were all rather hard and rough in their original state, but at present bear evidence of much persevering labor and good husbandry. The several statements respecting these are so full, as to render unnecessary any remarks of the committee. With regard to the bog-meadows, it is sufficient to say that these lands, formerly worthless, now produce large crops of good hay. The modes by which they have been reclaimed, may be learned from the statements of the competitors.

The committee were pleased to find that our farmers are paying so much attention to raising fruit. They visited orchards containing from one hundred to three thousand fruit trees. Many of these were loaded with fruit, and their owners have already received great profit from them. Of others, the profit is yet to come; but come it will, for there is nothing more profitable to the farmer than his fruit. The demand for good fruit is even now greater than the supply. Let those who think there is no profit in farming, look over the county and see how many farmers not only obtain a good support for themselves and families, but are every year putting out money at interest, or making greater improvements on their farms.

The committee award the premiums as follows:—

FARMS.

Thomas J. Damon, Wayland,	1st premium,	- -	$25 00
Charles Gerry, Sudbury,	2d "	- -	20 00
John P. Reed, Bedford,	3d "	- -	12 00

RECLAIMED MEADOWS.

Joel Wheeler, Concord,	1st premium,	- -	12 00
Daniel L. Giles, Lincoln,	2d "	- -	8 00

APPLE ORCHARDS.

William Wyman, Lowell,	1st premium,	- -	12 00

J. W. Brown, Framingham, 2d premium, - - $10 00

DAVID HEARD,
DANIEL L. GILES,
MOSES PRITCHARD, } *Committee.*

Thomas J. Damon's Statement.

My farm contains one hundred and twelve acres, twenty-five of which is woodland. I went on the farm in 1845. We cut at that time, about fifteen tons of English hay, and about twenty tons of meadow hay, which is about the usual crop yearly. I have six acres of reclaimed peat meadow, which five years ago produced nothing but coarse wild grass and bushes, not worth cutting. We have set and rebuilt one hundred and nine rods of wall, set one hundred fruit trees, and grafted most of the old apple trees with choice fruit.

The yearly produce of the farm now, is as follows. Forty tons of English hay; twenty tons of meadow hay; five tons of straw; two hundred bushels of corn; fifty bushels of rye; seventy-five bushels of oats; four hundred bushels of potatoes; sixteen cwt. of pork, and the income of seven cows.

Amount of produce sold last year:—

25 tons English hay, - - - -	$375 00
6 " straw, - - - - -	66 00
Oats and rye, - - - - -	50 00
14 cwt. pork, - - - - -	98 00
Gain on beef, - - - - -	50 00
20 bbls. potatoes, - - - - -	50 00
50 " apples, - - - - -	75 00
Pigs sold, - - - - - -	20 00
Butter, milk and veal, - - - -	172 00
Poultry and eggs, - - - -	25 00
Gain on stock wintered, - - -	50 00
	$1031 00

Expenses, beside my own labor:—

Paid one man, - - - - -	$150 00
" one man four months, - - -	52 00

Paid another in haying, - - -	$22 00	
20 cords wood burnt, - - - -	90 00	
		314 00
Leaving a balance of -		$717 00

Wayland, *Sept.*, 1851.

Charles Gerry's Statement.

I began five years ago on my farm, which contains one hundred and twenty acres, about twenty of which were English mowing, and yielded at that time twenty-five tons of hay. I now have twenty-six acres of English mowing, which produces fifty tons of English hay. I usually cut thirty tons of meadow hay on twenty-five acres of land. I have built, the last three years, one hundred and seventy rods of wall, and blasted rock for as many rods more. I usually winter twenty-five head of cattle, and keep in the summer season two oxen, two horses and seven cows.

From the fourth day of July last year to the first of May this year, I lost fifteen head of cattle, all of which died within one or two hours after being taken sick. The first appearance of the disease was dulness, then tremor or trembling, and drying up of the milk all at once. We opened one of the cows. The intestines were bright; the lights and liver appeared perfect; the kidney looked of a jelly substance; the melt was a clod of blood. I know of no cause of the disease, nor name for it. My cattle that were sick, all died, two oxen, five cows, six steers and two heifers two years old.

The income from what I sold last year, was

20 tons English hay, - - - -	$300 00
13 " meadow hay, - - - -	115 00
150 bushels potatoes, - - - -	150 00
150 " oats, - - - - -	75 00
600 cwt. pork, - - - - -	42 00
Pigs sold, - - - - - -	30 00
Poultry, - - - - - -	35 00

8 calves, - - - - - -	$42 00	
3 tons oat straw, - - - - -	30 00	
Cranberries, - - - - - -	100 00	
		$919 00
Manure bought and wood used, - -	20 00	
Help hired, - - - - - -	170 00	
Taxes, - - - - - - -	28 00	
		218 00
		$701 00

Time of myself and son, 18 years old, and small son, 12 years old.

SUDBURY, *August*, 1851.

John P. Reed's Statement.

The farm I offer for premium, was bought by me in the spring of 1833, for twenty-three hundred and fifty dollars. It contains about one hundred acres. I paid $950 in cash, leaving me $1400 in debt. The buildings then on the farm were very poor, and the farm was very much run out, having had nothing done on it for many years, but merely to take off what grew upon it. The fences were down, stones had been tilted up by their side, and brush was growing by the side of them, nearly all over the farm. The fruit trees were all old, and had suffered very much for want of trimming; there was but one grafted apple tree on the place, and not a pear, peach, plum or cherry tree. Thus, you will see, I was placed in rather unfavorable circumstances. Poor buildings, poor fences, farm run out, and I in debt for more than half its purchase money.

I have since built all new buildings, at a cost of about $2000. I have built about five hundred and ten rods of heavy stone wall, and hauled the stone for about fifty rods more. The wall I have built with my own hands, having a man or boy to help place the large stones. I have made about one hundred and twenty-five rods of under-drains or blind ditches, and dug about three hundred and fifty rods of open ditches. My barn is supplied with running water, conducted by a lead pipe from a well which I dug.

I have reclaimed about fifteen acres of rough stony land, that was nearly worthless, the stones being so thick in some parts of it, that, when dug, they would more than cover the ground. It now produces good crops, some of it more than two tons of hay to the acre. Twenty acres of meadow land, which was so wet when I bought it, that I had to carry on poles to the hard land, nearly the whole of the hay that grew upon it, and that of a very poor quality. I have ditched, bogged and burnt, so that the quality and quantity of hay have nearly doubled, and on some parts more than doubled. I can rake and cart nearly the whole of it with a horse. I have also grafted such of the old fruit trees as were suitable for this purpose, and set out new trees of the different varieties of fruit.

The farm now produces twice as much as it did when it came into my possession, the greatest income being from the sale of milk, which amounts to between $700 and $800 a year. But still I am in debt about $1000, having expended my profits in improvements on the farm, it being my object to make the rough places smoother, and two spears of grass grow where but one grew before. The help that I have hired on the farm, was, for the first six years, a boy fifteen or sixteen years old, and a man through haying. Since then I have hired a man for eight months in the year, and some years a boy. I have now on the ground five acres of corn, one and a half acres of potatoes, and have harvested three and a half acres of oats, which has been about my usual quantity for years past.

Bedford, *Sept.* 2*d*, 1851.

Abel Rice's Statement.

My farm contains fifty acres, and was formerly an old pasture, descending from one generation to another down to 1840, when it was purchased by a young man for a farm. He commenced building upon it, and remained four years, when he became discouraged and offered it for sale. I bought the farm, and removed to it in 1845. Since that time, I have done upon it all that I could do, without running in debt. Some of the improvements made by me are the following. I have finished the house, enlarged my barn and dug a cellar under it, built

sixty feet of shed and two hundred and ninety rods of stone wall, and planted out over eight hundred fruit trees. When I began on the farm, I found it well stocked with rocks and brush. My method of making mowing land out of rough upland pasture, has been, after cutting the brush and digging out some of the rocks, to plough it first with a large Dutch plough and six oxen. Wet land I have drained, carted on loam and compost, and seeded to grass.

Estimated amount of English hay cut on the farm the first year of my occupancy, - - - - 3½ tons.
Estimated amount the present year, - - - 14 "
Sales from the dairy in one year, over and above what was used in the family, including milk, butter and veal, $212 75
Labor hired on the farm in 1850, - - - 30 50
" " " " for 1851 to Sept. 1st, - 49 50

My stock of cattle have been kept in the barn, the present summer, about twelve hours out of the twenty-four, and the compost in the barn cellar is made of droppings from the cattle, loam and leaves, about equal parts. The compost on the border of the corn-fields is made of about one-half loam and the remainder stable manure and meadow mud, and has been about one year collecting. The other heaps of compost on the farm are made of loam, meadow mud, ashes, lime, plaster and weeds. I use forest leaves as litter and in making compost manure. I think we should make all our compost from our lands and stable.

REMARKS.

1st. My object has been improvement of my farm, rather than to obtain immediate profit from it.

2d. The six years that I have owned the farm, is the first of my farming.

3d. I never had one dollar given to me. I am not in debt one dollar, and when I have been in debt, I have always paid one hundred cents on a dollar.

4th. When I hear a farmer call farming a poor business, I guess he had his farm given him.

September, 1851.

Reclaimed Meadows.

Joel Wheeler's Statement.

The piece of meadow land to which I ask attention, contains about five acres. The soil is of a light peaty mud, varying from four to twenty feet deep. I commenced working upon it in the spring of 1848. It was then covered with water, alders, dogwood and brush, and consequently was of little or no value. My first operation was to ditch it, dig it over with a bog hoe and burn it. The following winter, I spread on sixty loads of sand per acre. In June, 1849, I sowed it with oats and grass seed, without any manure. I cut about one ton per acre, and obtained a good crop of fall feed. In 1850 I cut, on the same piece, two tons of handsome hay per acre, and might have cut a good crop of rowen, but preferred feeding it. In the fall of 1850, I spread on about twenty loads of compost manure to the acre, and this year I cut, by estimation, two and a half tons per acre. The whole expense of reclaiming and seeding down, was twenty-eight dollars per acre.

Concord, *Sept.* 5, 1851.

Daniel L. Giles's Statement.

The bog meadow, to which I invite attention, is about two and a half acres of what was, in 1848 and '49, in a wild state. A growth of wood was taken from it eight or ten years ago, and it was covered with stumps of maple, birch, and dogwood, with some scattering stumps of pine and cedars. For many years, it has been a fine harbor for minks and muskrats.

In the winter of 1848, I dug a ditch around the meadow, sixty rods long, from three and a half to five feet wide and four to five feet deep, at a cost of seventy-five cents per rod. The mud I carted into the barn-yard and hog-yard, with the exception of ten rods which I sold for five dollars where it was flung out. Mud carted and sold, worth about $35, besides paying for teaming.

In the summer of 1849, I mowed the bushes and brakes, and began to cut around the stumps and roots. Then with a lever

I upturned them. After remaining a sufficient time to become dry so as to be moved, we hauled them to the upland, and there were judged to be thirty cords, worth something for fuel or to be made into coal. We then filled up the holes and smoothed off the top and burnt what could not be disposed of in the holes.

In June, 1850, I sowed the meadow with oats, herds grass, red-top and clover seed, at an expense of five dollars. The oats were mowed in August for fodder, and when well hayed were thought to be three and a half tons, worth $12 per ton. In July 1851, I cut upon this meadow four tons of hay, as estimated, worth $12 per ton, and now there is on it a very good crop of fall feed.

Lincoln, *Sept.* 5, 1851.

Francis A. Wheeler's Statement.

In 1846, I began to reclaim the meadow, which I offer for premium. After haying, I dug a ditch on three sides of it, to let off the cold spring water, and I also cut up the largest hassocks upon it. Then late in the fall I borrowed a meadow plough and ropes, and struck in on the further side, ploughing to the depth of twelve or fourteen inches, the oxen being some ten or fifteen rods from the plough and on hard ground. After coming out to the end of the furrow, the plough was drawn back, and the cattle again started, and in this way we turned over an acre as well as we could.

In the spring of 1847, I went on with hoes and filled up the holes, so that I could go on with my horse and rackets to harrow; then planted potatoes. From less than an acre of this bog, I raised a crop which sold for $150, besides reserving enough to pay for all the manure that was applied. I was so encouraged by this success, that I turned over more than an acre in the same way that fall, and in the spring managed it as I did the first piece. The yield of potatoes was again great, but they were lost by the rot. In the fall harrowed it down, and in the winter carted on about sixty loads of gravel to the acre.

In the spring of 1849, I took the mare and rackets, and

ploughed and harrowed in the gravel with the mud, as nice as a pin; planted with potatoes again, thinking the gravel would prevent the rot, but I only saved about one hundred bushels to the acre; the rest went to manure the ground. In the fall, seeded down one acre with herds grass and red-top, and the year following, 1850, the first crop cut from that acre was about two tons. The remainder was seeded to grass in June of that year, and this season I cut at the rate of three tons to the acre of the best of hay.

I approve of this method of reclaiming wet meadows. Do well what you do, kill all the wild grass first, and you need not fear afterwards. This meadow was nearly worthless, except for peat and mud; now I consider it worth at least $200 per acre. The whole cost paid out for reclaiming was but $9 75, besides my own help.

Concord, *Sept.* 5, 1851.

Apple Orchards.

William Wyman's Statement.

My farm contains over forty acres and was purchased in 1840. I gave for the lot of land, which was covered with wood at the time, $7000, and sold the wood by auction, in November following, for over 3000. Late in the fall, I ploughed a furrow among the stumps and brush, and sowed my apple pomace. The second year, in the spring, I covered my young trees all with manure, which gave them a fine start; the third spring I set them out in my nursery, and in the fall most of them were budded. About the sixth year from the planting of the seed, the trees were set out. They are set in rows ten feet apart, one apple tree and then two peach trees. The rows are about thirty feet apart. Where my cherry trees are set, I have one peach tree between the cherry trees, ten feet apart. I have cultivated most of my rows every year. My orchard contains about 3000 trees, including apple, cherry, peach and plum, and covers about twenty-five acres of land. Many of the trees are in a bearing state.

Lowell, *Sept.* 3, 1851

Caleb Wright's Statement.

The land on which my orchard is planted, was, before I ploughed it, rocky and covered with bushes. The soil is a warm moist loam, with a clay bottom. I set out my trees, part of them in the spring of 1845, and part of them in the autumn of the same year. The spring I consider the best for transplanting. When the trees were set out, the ground was laid down, and it has not been ploughed since. I keep the ground dug up around the trees. I manure them with green manure and cover it with bushes. I wash my trees with a mixture of lime, clay, salt and green manure, which I consider better than potash for this purpose. The insect which most troubles me is the borer, and what I use to get rid of them is a mallet and gouge.

At the request of the committee, I give a description of my older orchard, mostly of Roxbury russets and Rhode Island greenings. I set it out forty-five years ago. For many years it bore well and the fruit was good. At length the fruit became poorer and less of it, and the general opinion is that the russet trees have run out. I think differently. The most of the russet trees are old ; when a tree is old it does not throw out as much sap according to its size as a young tree, and a scarcity of fruit is owing to too much top, and the tree is neglected. For a few years past, I have given attention to my Roxbury russet trees, and they have well paid me. I have pruned them closely. I cut out the small branches and trimmed off the large ones within a few feet of their ends. They bore well last year and hang full this year. The fruit is good. It sold in the market last spring for $4 50, without repacking. I would say to those who have the trees, don't give up the russets.

Westford, *Sept.* 5, 1851.

A. G. Wing's Statement.

The young orchard which I offer for consideration, consists of about 190 Baldwin, and about 50 other choice varieties of apple trees. I purchased the land on which they stand in

1847; it was an old worn-out pasture nearly overgrown with bushes. I cut the bushes and ploughed the ground in April, and set out the trees the first of May. The trees were two years from the bud when set, and were set thirty feet apart each way. The land is a dark gray loam, with a very hard subsoil of clay gravel.

My mode of setting was to dig a hole about four or five feet in diameter and from twelve to fifteen inches deep; then fill the place two thirds or more with old turf, of which there was a great abundance turned up by the plough. I then dropped about one bushel of well-rotted stable manure near each place and mixed it thoroughly with the best of the loam, sufficient to fill the hole. I then covered the turf with the mixture and set the trees very near the top of the ground.

My method of treatment has been to wash thoroughly with potash, one pound to a gallon of water, applying it with a scrubbing brush and rubbing the trees hard, once or twice a year. I have kept the ground tilled every year, with crops of corn, squashes, cabbages, beets, onions, and various other things.

Dracut, *Sept.* 3, 1851.

David C. Butterfield's Statement.

My apple orchard consists of 147 trees, set out as follows. In 1846, I set 40 on one acre enclosed by a stone wall before setting the trees. I sowed the ground with oats and grass seed, hoed round the trees a space about six feet and have kept the space free from grass and weeds by frequent hoeings, enlarging it a little every year as the trees have increased in size. In 1847, I manured them with coarse manure from my horse stable, by hoeing a small trench from the tree as far as the clear space extended; spread the manure in the trench and dug it in. In 1849, I took the same course to manure the trees as in 1847, and repeated the hoeings. In the fall of 1850, I ploughed the ground as deep as I could, cross-ploughed last spring, spread twenty-five loads of manure and planted it with potatoes. Since digging the potatoes, I have ploughed the ground both ways, spread forty horse loads of manure and sowed it with grass seed.

In 1847, I set out twenty six apple trees and seeded the ground to oats and grass as before, but the oats lodged and killed the grass so much that I ploughed the next spring and have kept it ploughed until the present season. In 1848, I set forty-seven trees on a very rough piece of ground that had been planted one year and sowed it with oats. In September I ploughed in the stubble, spread thirty loads of manure to the acre, cross-ploughed and sowed grass seed, and have hoed round them and manured in the same way as above described. In 1850, I set thirty-four apple trees in grass ground, dug the holes as deep as I wanted to set the trees, spaded up the bottom of the holes as deep as the length of the spade, set the trees and covered the space with old hay. Last spring I dug about a foot farther round the trees, added more hay, after spreading a coat of manure from the horse stable. The first of August I removed the hay and hoed round the trees, after mixing the manure with the earth.

The soil in which my trees are set is a deep rich loam, very rocky and a portion of it quite moist. Therefore I prefer horse manure to any other, as it is of a warm nature. In regard to insects, I examine my trees before they leaf out, and take off the eggs of the caterpillars. I have made a practice of examining them twice a year for borers, in June and September, by hoeing the earth from the tree down to the roots and scraping the bark with a knife. In this way the borer is easily discovered. I have found but three trees this season, that had any in them. I wash my trees once a year with a wash made of lime, potash, green cow manure and a little salt.

Westford, *Aug.* 28, 1851.

Enos Wiley's Statement.

My trees are on land that was a poor pasture when I bought it. The soil is light, gravelly, sandy and loamy. I broke up the land about a month previous to setting the trees, which was in the fall of 1845 and 1846. At setting the trees, I trimmed off all the bruised roots and the ends of broken ones, and the spring following took off part of the tops. Care was taken not to set the trees too deep and to have the soil solid under

the main roots. After the roots were covered, meadow mud was placed round the trees. I set them two rods apart by a square.

I have washed my trees with soft soap suds and potash water, one pound of potash to three gallons of water for young trees. I have been troubled but very little with borers. I have kept the ground around the trees free of weeds and the rough bark scraped clean near the ground, where they usually deposit their eggs. I have kept the trees trimmed up about five feet from the ground, which gives room to plough under them, and prevents cattle from breaking the tops. Three branches are left to form the top. The land is cultivated in strips by the trees, and what manure is used for planting keeps the trees thrifty and in good order. A board placed on the southwest side of the trees, until the top is large enough to shade the body, is highly beneficial, as it prevents the sun from striking them and thereby impairing their growth.

South Reading, *Sept.* 3, 1851.

[Of the other competitors, statements respecting their orchards have heretofore been published in the *Transactions of Agricultural Societies*; viz.: of Leander Crosby in 1848, of J. W. Brown, in 1849, and of George M. Baker in 1850.]

Milch Cows.

The premiums for milch cows of native breed, were awarded as follows:

To Alexander Wright, of Lowell,	1st premium,	-	$8 00
" James Tuttle, of Acton,	2d "	-	6 00
" Elijah M. Reed, of Tewksbury,	3d "	-	4 00
and to Peter Lawson, Dracut, Ayrshire cow,	1st prem.		8 00

Alexander Wright's Statement.

The native cow offered by me for premium, was purchased out of a drove from Vermont, when three years old. She is now nine. She calved early in January, 1850. From the 10th of that month to the 20th of August, 1851, she gave 9027

quarts of milk, the measure being the common milk or beer quart, and the weight per quart of milk two pounds, when weighed warm from the cow. The greatest quantity given per day was in June of 1850, viz., twenty-one quarts and one gill.

Her next calf was dropped on the 12th of this month, and it was not without considerable trouble she was dried by the 20th of August, as above. Her milk is very rich in cream; it has been frequently tried and found to produce one pound of butter from seven quarts of milk. During winter, and a part of the summer, she is fed morning and evening, as follows, viz., one quart of Indian meal and one quart of shorts, with one gill of malt, are put in a pail and boiling water poured on till the pail is nearly full; the contents are stirred, the pail covered with a thick cloth and left till the next meal to cool. In winter she has a peck of carrots daily, at noon, in addition.

QUANTITY OF MILK GIVEN EACH MONTH.

January,	1850.	20	days.	15	quarts.	300	quarts.
February,	"	28	"	16	"	448	"
March,	"	31	"	17	"	527	"
April,	"	30	"	17	"	510	"
May,	"	31	"	20	"	620	"
June,	"	30	"	21⅛	"	636	"
July,	"	31	"	21	"	651	"
August,	"	31	"	20	"	620	"
September,	"	30	"	18½	"	555	"
October,	"	31	"	17	"	527	"
November,	"	30	"	16	"	480	"
December,	"	31	"	14½	"	449	"
January,	1851.	31	"	14	"	434	"
February,	"	28	"	14	"	392	"
March,	"	31	"	13	"	403	"
April,	"	30	"	12	"	360	"
May,	"	31	"	12	"	372	"
June,	"	30	"	13	"	390	"
July,	"	31	"	9	"	279	"
August,	"	20	"	4	"	80	"
Total number of quarts, - - -						9027	

LOWELL, *Sept.* 1851.

James Tuttle's Statement.

The cow which I present for premium, has been owned by me three years. In the summer she has had good grass feed, and that only; in the winter two quarts of Indian meal per day, and what good hay she wanted. She calved the last day of August, 1850.

In September, she gave	20	quarts per day,	600	quarts.
" October, "	18	" "	540	"
" November, "	17	" "	510	"
" December, "	16	" "	480	"
" January, "	14	" "	420	"
" February, "	14	" "	420	"
			2970	

Acton, *Sept.* 24, 1851.

Elijah M. Reed's Statement.

The native cow offered by me for premium, is eight years old. She was raised in the State of Maine, and has been owned by me four years. She calved, February 8th, 1851. The quantity of milk given by her in each month, commencing February 12th, is as follows:

In Feb.,	221½ quarts.	In June, - -	483½ qrts.
" Mar.,	416 "	" July, - -	314¾ "
" April,	408 "	" August, - -	496 "
" May,	422½ "	" Sept., to 12th inst.	110½ "
			2572¾ quarts.

To test the quality of milk for butter, her milk was kept for that purpose, one week in April, and one week in June, with the following result: from April 28th, seven days, ninety-seven quarts of milk, which produced thirteen pounds of butter, after the butter milk was well worked out. The butter was solid and yellow, like June butter. From June 5th, seven days, ninety-five quarts of milk, from which fourteen and a half pounds of butter, of an excellent quality, was made. Her

keeping through the last winter, was good English hay, with the addition of one quart of meal and two quarts of shorts, from February 8th to June 1st, when she was turned out to pasture. She has had no meal since, excepting one week in June, (when we were making butter,) she had three pints per day. It will thus be perceived that a pound of butter was produced from every six and a half quarts of milk, in the June trial, and from about seven quarts in the April trial. It is in the quality of her milk that I expect she may excel, though the average quantity has been over twelve quarts per day for the last seven months. I tested its properties for butter, in April, 1850, and from twenty-seven and one quarter quarts of mornings' milk, we made four pounds thirteen ounces of butter. I sell her milk at the door, and have only had an opportunity for a few trials.

Tewksbury, *Sept.* 24, 1851.

Peter Lawson's Statement.

My Ayrshire cow, "Charlotte," has had no grain, whatever, and has given an average yield of sixteen quarts of milk per day, this season. We have made no butter.

Dracut, *Sept.* 24, 1851.

P. D. & T. S. Edmands's Statement.

The cow which we offer for inspection, has been in our possession four years, and is seven years old. She calved about the middle of May, while at pasture; calf taken from her in ten days, to be raised. We keep no other cattle with her this season. During the month of June, she had no other feed than a poor pasture; for the last six weeks has had one acre of mowing in addition to the pasture; also, the refuse of the vegetables that we carried to market. The cow is of native breed, and was raised in Lowell.

From June 2d to the 28th, twenty-seven days, her milk weighed one thousand and nine pounds. The first seven days in September, her milk weighed two hundred and twenty-two pounds.

Chelmsford, *Sept.* 22, 1851.

Heifers.

The committee (Elijah M. Reed, Chairman,) state that the animals presented were of a better description than those at the last exhibition of the society. They were much pleased to perceive this evidence of an increased desire on the part of farmers, to improve their stock. There is yet among us too much negligence in the selection of breeding cows, and of calves for raising for dairy purposes. Every person who keeps a cow, is more or less interested in this important subject.

Butter.

There was awarded for butter, "the best new churned, not less than twelve pounds in the specimens exhibited:"

To	Samuel Osgood, Billerica,	1st	premium,	$3 00
"	Caleb Livingston, Tewksbury,	2d	" -	2 50
"	E. Kimball, Littleton,	3d	" -	2 00
"	Asa Hodgman, 2d, Chelmsford,	4th	" -	1 50
"	William Harris, Woburn,	5th	" -	1 00

Samuel Osgood's Statement.

I present for inspection one box of new churned butter, being a specimen of two hundred and seventy-five pounds, made from the 1st of July last, from the milk of three cows. We have used milk in the family, averaging about one quart per day. The cows have had common pasture until the 1st of August; since then they have had corn-fodder once a day.

Process of making.—The milk is strained into tin pans, and stands in a cool cellar from thirty-six to forty-eight hours, when the cream is taken off and put into tin cans and stirred daily. We churn once a week. After it is churned, the butter milk is thoroughly worked out with the hands and salted to the taste. After standing twelve hours, it is again worked and weighed, each pound separately.

Billerica, *Sept.* 21, 1851.

Caleb Livingston's Statement.

The butter I present was made as follows: the cream was taken from four days' milk; churned in a common churn about half an hour; taken out and salted with ground rock salt, to suit the taste; worked and lumped the next morning; worked entirely by hand, without the aid of any mould or other apparatus.

Tewksbury, *Sept.* 24, 1851.

Asa Hodgman, 2d's, Statement.

The box of butter that I offer for premium was made from the milk of six cows, three of which are nearly dry, having calved last winter. I sell my night milk and Saturday morning milk. I strain my milk in tin pans, and set it in the milk room on the north side of the house. The milk stands from forty to forty-eight hours, according to the weather. The cream is then taken from the milk and put into stone jars in the cellar, always putting a handful of salt in the bottom of the jars, and stirring the cream every day. I churn once in six days, in a dash churn; then the butter is well rinsed with cold water; worked and salted, with about an ounce of salt to the pound.

Chelmsford, *Sept.* 23, 1851.

Bread.

The premiums were awarded as follows:

To Mrs. Jane H. French, Lowell,	1st premium,	$4	00
" E. French, "	2d "	2	00
" Betsy Caldwell, Dracut,	3d "	1	00
To Miss Phebe Jane Worcester, best bread offered by a girl, - - - -		4	00
" Harriet Page, Lowell,	2d premium,	2	00
" Julia M. Pierce, Chelmsford,	3d "	1	00

A gratuity of one dollar was awarded to Mrs. H. W. Chase,

of Lowell, for a loaf of bread, which was unanimously considered by the committee to be the best bread upon the table, but in which *potatoes* were mixed with the wheat. As the society's premiums were offered for wheaten bread, it was thought that this bread did not come within the rule.

Agricultural Experiments.

The committee, consisting of Alfred Allen and Peter Lawson, award the premiums on grain and root crops, as follows:

To N. P. Morrison, Somerville, Rye, the premium of		$10 00
" John Hayward, Ashby, Indian Corn,	"	10 00
" Samuel Eastabrook, Ashby, Carrots,	"	6 00

N. P. Morrison's Statement.

The following is an account of a crop of winter rye, which I raised on one acre and thirteen square rods. I sowed in September, after taking off a crop of potatoes, about three pecks of seed to the acre. On good land I would not sow more than twenty-six quarts to the acre, on any account, say from the first to the middle of September, if I wanted a large crop of grain. My rye was threshed in September, put in barrels and remained where it has been some exposed to the fowls, until last week. I then measured forty striked bushels for W. & J. Libbey, of Boston, which I sold, fifty-six pounds for a bushel, at eighty cents per bushel. The gain was two and a half bushels and eight pounds, which made about sixty pounds to a striked bushel.

The amount paid was - - - -	$34 11
7½ striked bushels reserved at home, (at same rate,)	6 37
Straw sold for mats, 4065 lbs. at 80 cts., - -	32 52
" " filling beds, 156 lbs., - -	95
About 300 lbs. loose straw, kept for bedding horses,	1 50
Total, - - - -	$75 45

Deducting the proceeds of thirteen rods, it gives forty-four striked bushels to the acre, and by weight forty-six and three-quarter bushels, which amounted to about seventy dollars per acre.

Somerville, *Dec.* 17, 1851.

John Hayward's Statement.

I offer for premium a crop of eighty-four and three-quarters bushels of sound Indian corn, raised on one hundred and fifty-four rods of land, it being all of the piece planted. The soil is a dark loam, sloping slightly to the southeast. The corn planted is of the small, early, eight rowed kind. The ground was broken up in October, 1849, about nine inches in depth. May 1st, I cross ploughed and spread ten cart loads of manure from my barn cellar, and harrowed it in. About the middle of May, I planted with corn, which yielded about seventy bushels.

May, 1851, the hills were split, and twelve loads of manure spread thereon and the land cross ploughed at the depth of seven inches. May 12th, furrowed one way only; put in the hills eight loads of compost manure, which was made fine by being twice thrown over in the spring. May 12th and 13th, the ground was planted, three feet ten inches one way, and about two feet eight inches the other. Hoed three times; at each time used a small harrow made for the purpose, and raised the ground about the corn only a little. The second week in October the corn was cut up and harvested.

Ashby, *Jan.* 2, 1852.

Carrots.—My crop of carrots was raised upon twenty-seven and three-quarters rods of land. It is a strong, deep soil, on which I have raised carrots five years in succession. After harvesting them in the fall of 1850, I spread six loads of barn cellar manure and ploughed it in. Ploughed again in the spring, as deep as possible, raked the ground over and sowed with a machine in drills one foot apart, half a pound white and half a pound orange seed. Hoed as soon as they were up so as to be seen. When the carrots are two or three inches high, I weed

and thin them, so as to leave them from two to four inches apart. My crop this year was one hundred and seventy-five baskets, weighing fifty pounds per basket.

Expenses.—Cost of seed, 75 cents; cost of manure, $6; ploughing, $1; weeding and thinning, $5; harvesting, $4. Total, $16 75.

Ashby, *Jan.* 1, 1852.

WORCESTER AGRICULTURAL SOCIETY.

The undersigned, President and Recording Secretary of the Worcester Agricultural Society, report that the said society held their last cattle show at Worcester, on the 18th day of September last; on which occasion, the very large assemblage of citizens of this county, and of other parts of the Commonwealth, gave evidence that the interest of the public in agriculture, and in the welfare of this society, continues unabated.

The number of the entries made was large, and the character of the stock exhibited, such as fully to sustain the high reputation of the farmers of this county, as stock breeders, and for their skill in training their cattle.

The amount of money offered to be be distributed in premiums, to be paid within the year, is $833, which includes the sum of $50, to be awarded "for experiments in determining the advantages or disadvantages of cutting hay as food for stock," the award to be made in March next.

The reports of the several committees, and the statements of experiments and cultivation, regarded as worthy of publication, will be found in the printed volume of the Transactions of the Society, herewith transmitted. The address before the society was delivered by J. S. C. Knowlton, Esq., of Worcester.

JOHN W. LINCOLN, *President.*
WILLIAM S. LINCOLN, *Rec. Sec'y.*

Ploughing Match.

First in the order of the public exercises of this anniversary festival, was the ploughing match. It was fitting that, *that work* should take the lead in an agricultural exhibition, which lies at the foundation, and is indispensable to all agricultural improvement.

The earth would be either sterile or continue to bring forth, as under the primeval curse, only briars and thistles, but for that process of amelioration, which results from stirring its surface, separating its particles, infusing into its bosom the influences of light and heat, and air and water, and so mingling the elements of productiveness, as profitably to employ the hand and give reward to the toils of labor. The history of the plough, from the earliest times, in its construction, its application, and its improvement, to the present day, marks, with unerring progress, the advance of civilization, domestic comfort, and social enjoyment. With a savage and barbarous people it is never found, and with men driven for subsistence from the chase to the cultivation of the earth, it is first seen in the rude shape of a pointed stake, or a hook, or the knotted or crotched limb of a tree, drawn at the one end and held and guided by the other. It is not necessary to go to distant countries, or other times, for facts or illustrations, whereby to trace the improvements which have been made in this most important implement of labor, to its present beautiful and seemingly perfect model of construction. *Here, at home*, and within our own famed, if not boasting county, the memory and personal observation of many here among us, will suggest the comparison. The county of Worcester has long been noted for its skill in plough making. Within the period of the present generation, John Wesson, of Grafton Gore, had a reputation little less marked, within the limited extent of his capacity of supply, than is now enjoyed, far more deservedly and widely indeed, by our own Ruggles & Mason. Yet how immeasurably different in power and completeness the implements of their respective production! Wesson's plough was of *wood*, with an iron coulter and share only. The mould board, if secured at all from accident and sudden force, or rapid destruction by wear, was left to be protected, in the judgment or convenience of the purchaser, by a plating of rusty iron hoops, or worn and inverted horse shoes, or such like appliances, quite as effectual, in their use, to the resistance of the power of draft as to the endurance of the instrument. The *cutter*, to divide with an easy force the sward;—the *clevis*, to guide and guage the width of the furrow,—and the *wheel*, to

direct and govern its depth, were alike unknown or unused. If, with such an implement, the husbandman was not to be seen, as in the story of Scripture, *ploughing with twelve yoke in the field*, it was, probably, because the field was easier, or his team stronger, rather than the plough any better than in the days of the Prophet. To improve the construction of this implement has worthily engaged the science and occupied the skill of ingenious and philosophic men. The use to which it is designed indicates the power which it should possess. To divide as by a *wedge;* to raise and elevate as with a *lever;* and to turn over as upon a *pulley*, is its office; and to be perfect in its adaptation, all these mechanical capacities must be united in its construction. At a recent exhibition of the world's ingenuity, skilful and wise men are said to have adjudged the attainment of this excellence to *American art*, and henceforth, the ploughs manufactured in Massachusetts by Prouty & Mears, and in the rival and no less celebrated workshops of our fellow citizens, Messrs. Ruggles, Nourse, Mason & Co., and of Martin, may be relied upon by the farmer, as models of completeness in design and finish for the accomplishment of his important and arduous labor.

It is declared, in the proposals of the trustees, to be the great object of the ploughing match "to excite emulation in the *use* of this most important instrument of agriculture," as well as in its construction. If the instrument has been carried to great perfection, care should be had that corresponding improvement is attained in guiding its operation. Here the observation, skill, steadiness, and strength of the husbandman are called into exercise. A vacant or wandering eye, and a slack hand, will do little in directing the plough beam aright. The furrow should be uniformly wide, of the requisite depth for the cultivation of the land, and the furrow slice laid *up*, or laid *over*, according to the properties of the soil, and its productiveness. Much, also, in the character and economy of the work depends upon the *team* and its management. It has already become the settled conviction of the trustees of this society, that with one of the improved ploughs, and a single yoke of well matched and well trained oxen of common size, most of the ploughing on a New

England farm may be well executed. But what occasion does not this give for attention and skill, on the part of the ploughman! There are his cattle to mind and manage, his plough to direct, and his work constantly to notice that it be true and thorough. The competition in our ploughing matches is therefore no mere holiday sport or pastime. It becomes, indeed, the test of experience and good effort, and exhibits, as intended it should do, the judgment and expertness of the man, both in the management of the plough and the discipline and effectiveness of his team.

In the exhibitions of this occasion, the committee on the ploughing match find much reason for congratulations to the society. The number of entries certified to them by the secretary, was unusually large, amounting to eighteen. Sixteen teams started in the contest, and the committee carefully examined and noted the progress of the work in each lot, and the *time* and *manner* of its performance. The soil of the field was a light loam upon a subsoil of clay, and the sward, for many years unmoved, was rendered unusually tough and firm by the late severe and long continued drought. The power and patient endurance of the cattle were thus severely tested, and the labor of the ploughman, in laying his furrow, greatly increased. In other respects, the land was well adapted to the purpose, having a smooth and level surface, and being especially free from stone.

In the judgment of members of the committee, who had been familiar with such scenes, and could compare similar competitions, *here and in other counties*, the work, in all which constitutes its perfection, was never better executed. The ploughs which were used, are noted against the names of each of the successful competitors, and the best effect of the exhibition will be seen in the influence it cannot fail to produce upon the thousands of gratified spectators who witnessed the quiet and effective performance of the labor. There was neither hurrying, nor noise, nor whipping or goading of cattle to undue speed,—but man and animal went steadily forward as to their accustomed task. The lots contained *one tenth* of an acre each. The length of the furrow was sixteen rods, and the required depth *not less in*

any part than six inches. The ploughs were each drawn by a single yoke of oxen, the ploughman driving his team.

The committee adjudge, that Henry S. Stockwell, of Sutton, with Martin's plough, and a yoke of five years' old cattle, is entitled to the first premium of ten dollars.

They award to Elbridge G. Wheelock, of Millbury, with Ruggles, Nourse & Mason's plough, and four years' old cattle, the second premium of nine dollars.

To Benjamin Harrington, of Westborough, with Ruggles, Nourse & Mason's plough, and four years' old cattle, one fourth Ayrshire, the third premium of eight dollars.

To Harvey Putnam, of Sutton, with Martin's plough, and four years' old cattle, the fourth premium of seven dollars.

To Calvin D. Nourse, of Westborough, with Ruggles, Nourse & Mason's plough, and six years' old cattle, the fifth premium of six dollars.

To George Stockwell, of Sutton, with Martin's plough, and four years' old cattle, the sixth premium of five dollars.

The work was beautifully done by quite a lad, apparently not more than fifteen or sixteen years of age.

To Rufus King, of Sutton, with Martin's plough, and four years' old cattle, the seventh premium of four dollars.

To Anson Warren, of Westborough, with Ruggles, Nourse & Mason's plough, and four years' old cattle, the eighth premium of three dollars.

To Reuben Carpenter, of Sturbridge, with Ruggles, Nourse & Mason's plough, and five years' old cattle, the ninth premium of two dollars.

To Lorin Carpenter, of Sturbridge, with Ruggles, Nourse & Mason's plough, and five years' old cattle, the tenth premium of one dollar.

The time occupied in ploughing by the several teams, varied from *thirty-five to fifty* minutes. The committee paid less regard to this circumstance than to the character of the work; but from the great severity of the draft, they gave some consideration and allowance to the age and weight of the youngest and lightest cattle.

It was noticed by the committee, after making up this report,

as a singular coincidence, that of the twelve ploughs on the field which performed the best work, six were of the manufacture of Ruggles, Nourse & Mason, and six from the workshop of Martin & Co., or as was wittily remarked by a bystander, it was "six of one and half a dozen of the other."

LEVI LINCOLN, *Chairman.*

Bulls.

Two of the twelve bulls entered for exhibition and premiums, were those presented by the Massachusetts Society, which were most splendid animals, and made a bold and lofty appearance as they stood at the head of their class. It was understood that many beautiful young cattle, the progeny of those two last named bulls, were in the pens.

The committee, after a careful examination of the merits of the several bulls, and taking into consideration all the facts in the case, awarded the premiums as follows:—To Caleb Nourse of Bolton, the first premium of $10, for the best bull, not less than two years old, weighing 1505 lbs., ¼ Creampot and ¾ Native. To J. D. Lovell of West Boylston, the second premium of $7, for the next best bull, weighing 1540 lbs., ¾ Devon and ¼ Durham. To Asa Holbrook, of Holden, the third premium of $5, for the next best bull, ½ Devon and ½ Native. The bulls which the committee passed over in awarding premiums, were all, without exception, beautiful animals, and well deserving premiums, had such been at the disposal of the committee. The white bull of Marshal J. Maynard, of Northborough, attracted the attention of the committee on account of its fine form and silk-like hair. The bull of Benj. Willard, of Lancaster, drew attention also, but was not entered in time to receive a premium. A bull was presented for exhibition, by H. B. Lyman, of Providence, R. I., upon which the committee would have been glad to make some remarks, but the age of the animal passed that duty into the hands of the other committee.

[They say respecting this animal:—Among the bulls exhibited, but not entitled to compete for premiums, was the bull

Sampson, whose merits are quite too remarkable to be passed by in silence. It is 19½ months old and weighs 1400 lbs., was raised in North Providence, R. I., and is owned by Mr. Lyman. This animal is imposing in size, perfectly symmetrical in shape, and seems to possess, in a rare degree, all the qualities of a good breeder. Its small head, well cut neck and wide breast—long, straight back and well rounded body, and neat clean limbs, rendered it, on the whole, superior to any of its competitors and highly deserving of commendation.]

The chairman wishes to say a word, on his own responsibility, on the raising of bulls—as he cannot look back thirty years and see so much improvement in the breeds of cattle as many imagine there is. It is too often the case that a farmer has two or three animals of the right kind, while all his others are the reverse for the want of a good bull in his neighborhood. It is very important that all our bulls be of good form and pure breeds, even if their calves are to be fattened and slaughtered at five or six weeks old—for every calf at that age will be worth one-third more than when the bull is of ill shape and of a worthless breed. For a remedy for this bad state of things, the following plan is suggested, which would, if carried out, give us almost a different race of cattle from what we now have, and here in Worcester county increase their value thousands and tens of thousands of dollars without increasing their numbers:—That all the Agricultural Societies in the county increase their funds to at least ten thousand dollars—that they all unite in the purchase of a farm with this extra increased fund—that this farm be under the control of the trustees of the societies—that a superintendent be placed on the farm, whose whole business shall be the raising of bulls of the purest blood, from the best of breeds, and to continue raising till every town in the county shall be supplied with, at least, from ten to fifteen bulls, on such terms as the trustees shall direct. Should the above plan be carried out, the hundreds of little, peaked and ill shaped bulls, that are every year scraped up in the neighboring states, would no longer find a market in Worcester county on farms where the owners now say, *a bull is a bull.*

CHARLES BRIGHAM, *Chairman.*

Working Oxen.

To say that there were well trained cattle and skilful drivers on the ground, is but making a record of what was witnessed by the gazing multitude. The interest in this part of the exhibition has always been manifested by numerous competitors and thousands of spectators—the scene is an exciting one, entered into both by the ox and his master—and it should be remembered that the *teamsters* are as closely observed as the *teams*—and that opinions are formed in reference to well-trained *men*, as of well-trained *cattle;* those that performed the best were not struck a blow, neither were they frightened by *Babel* like language from the top of the voice. The whip in the hands of a skilful driver will be *observed*, but not *felt* by the cattle. We live in a day of reforms, and it is a question whether the ox should not share our sympathy. *Humanity* and *self-interest* call loudly for a change. As applicable to the subject, the following extracts are from the transactions of the Westborough Agricultural Society for 1850, from the report of L. H. Boutell.

"The training of cattle is a subject deserving of much more attention than is usually bestowed upon it. Cattle are intelligent creatures, and should be treated as such, if we would use their powers to the best advantage. The degree of their intelligence is indeed small, compared with that of man; whatever may be its extent, it is governed by the same laws which regulate human intelligence.

"The person who undertakes to train cattle, should possess judgment, patience, tact, and a right mixture of gentleness with firmness. It should never be intrusted to those who have never been trained themselves, nor to ignorant and irritable men.

"It is necessary to be careful about the language employed in their government, and always to use the same term to denote the same thing. The language of teamsters is often nothing but nonsensical jargon; and we have sometimes wondered that cattle did not stand still in utter astonishment as the driver bawls out a dozen different commands in the same breath. Such drivers generally end their commands with a blow, and

wonder at the stupidity of animals that did not know enough to haw, gee, back, and go ahead, all at the same time.

"Your committee are aware that these suggestions contain nothing new; but they feel that they are so important, and yet so little attended to, that they deserve to be urged upon the consideration of our farmers.

"They feel that it is important for the farmer constantly to bear in mind that the animals which are so useful, so absolutely necessary for him to perform his daily labors, are not mere machines, but creatures of intelligence; that they have not merely bones, and muscles, and sinews, but capacities of thought and feeling, capable of improvement to a degree which will amply repay whatever labor may be bestowed upon their development."

There are wanted more well-trained cattle, and an increase of well-trained and skilful men to use them. May it not be found expedient to create additional premiums, such as will have a tendency to awaken an increased interest in this department of farming? say

"For the best pair of Working Oxen *raised*, *owned*, and used by the driver of the same."

Also,—"For the most skilful driver."

If, on inquiry, it should be found that cattle are purchased and trained *expressly* for these exhibitions, then sold—it will be obvious that for the want of a *uniform language* their usefulness will be curtailed and their sufferings increased; could the noble animals speak out, there would unquestionably be a call for a convention to consult upon their grievances, and to adopt measures that would ensure the use of such terms, as would enable them to know the wishes of their masters.

GEO. DENNY, *Chairman.*

Steers.

Among the many requisites for good farming one of the most important is a good team; and it is conceded that an ox team is preferable for general use upon our New England farms.

With most of our farmers a good yoke of oxen can be more easily raised than bought and *paid for:* or, in other words, the value of a good yoke of cattle being about one hundred dollars, that sum is more easily produced by raising and training a yoke of cattle upon the farm where they are wanted, than the same value can be produced by any other ordinary farming operations; and these remarks are equally applicable to other descriptions of stock.

It requires no very great discernment to see that those farmers who raise stock for their own use, and of course to sell, are, as a general rule, more thrifty and prosperous than those who are constantly scouring the country to buy. If these remarks are true, there is certainly a want of good management among us, that we are obliged to send our money to neighboring States to purchase inferior stock for our farms.

In rearing steers for the yoke, the requisite qualities for good working cattle, form, strength, size, temper, &c., should be looked to in the parentage on both sides. Experience has shown that calves from young cows are preferable, and that good care and attention should be bestowed upon them during the earlier part of their growth, keeping them in good health and thriving condition, that they may take on that fine form and appearance which adds so much to their value in older growth. More attention should be paid to matching steers in regard to size, strength, and working qualities than to color and other points, which are mere matters of fancy.

In training steers, patience and good temper are very requisite in the driver—and with all, good judgment—a knowledge of what the team is capable of doing, and the best way to do it—and with these qualities he should have language to express himself to his team. A few words that can be understood by human beings, will answer quite as well as the unmeaning *lingo* that is often heard in the management of cattle.

The committee having stated the foregoing as embracing their views of the subject, further report that there were thirty entries of steers, and five of calves, nearly all of which were presented for examination, and it was a source of great satisfac-

tion to see so many fine cattle, all promising to become oxen of the best description.

GEORGE C. DAVIS, *Chairman.*

Milch Cows.

Fourteen cows were shown for premium and two for exhibition. There was no competitor for the highest premium offered by the society, viz: "for the best dairy of cows, not less than five, owned and kept together from May 1st, to Sept. 10th, *three* of which shall have been *raised* and *bred* by the applicant, and one of which to be exhibited."

The first premium of the second class, (which requires that *two* of the cows shall have been *raised* by the applicant,) was awarded to Marshall J. Maynard, of Northborough, for the two best cows from a stock of five, $17.

The premium of $12, for the two best cows from a stock of not less than five, is awarded to William S. Lincoln, of Worcester.

To Henry Parker, of Holden, for the best cow kept with a stock of not less than four, is awarded the premium of $10.

To Horace Chenery, of Worcester, "for the best cow kept alone or with others," is awarded the premium of $8.

To Asa F. Rice, of Worcester, for the next best cow kept as above, the second premium of "Colman's Agriculture."

To Joseph A. Reed, of Princeton, a gratuity of $6.

To Harvey Dodge, of Sutton, a gratuity of $2.

Our farmers have of late made very great improvement in the breed and quality of their cows. This is as it should be; for it is believed that no other investment in agriculture is so profitable or will yield so rich returns as the dairy. One of the claimants for a premium states that between the first day of June and the tenth of September, the present year, he sold about *eight thousand quarts of milk* from seven cows, besides what he used in his family. This at the low price of four cents per quart would be three hundred and twenty dollars. Now, supposing these seven cows to be worth 280 dollars,

which is 40 dollars per cow, then in three months and ten days these seven cows would pay for themselves and one more of equal price, or yield a return of more than one hundred and fourteen per cent. for the same time.

JAMES DRAPER, *Chairman.*

Marshall J. Maynard's Statement.

I offer for premium three milch cows:—

1st, (Phillipine) native breed, 7 years old, raised by myself, calved March 3d last. Calf extra, and is raising. From the middle of March to the 10th of May, she averaged a daily yield of 36 lbs. milk. From the 1st to the 10 of June, inclusive, she gave 294 lbs. 12 oz. milk, from which was produced 14 lbs. 6 oz. butter. In the same number of days (the 10 first) of September, she gave 222 lbs. milk, which yielded 12 lbs. 8 oz. butter.

The second cow, (Dian) native breed, four years old, raised by me—calved March 25th, calf fatted and killed at three weeks and four days old, weighing 95 lbs. From the first to the tenth of June, both inclusive, she gave 289 lbs. 12 oz. milk, which yielded 13 lbs. 6 oz. butter; and in the first ten days of September, she gave 201 lbs. 8 oz. milk, from which was made 12 lbs. butter.

The third cow, (Lizzy) native breed, calved marched 20th—she is eight years old and was raised by Nahum Eager, of Northborough. From the 1st to the 10th of June, inclusive, she gave 323 lbs. milk, from which was made 12 lbs. 12 oz. butter, and in the ten first days of September, she yielded 234 lbs. milk, producing 10 lbs. butter.

"My dairy consists of 7 cows and one 3 year old heifer. I have sold the present season 924 lbs. butter—fatted 550 lbs. veal, and raised three calves, good ones—have made what cheese and butter was used in the family; have raised 25 pigs—sold $21 25, and have $50 worth of pigs on hand. Have fed stalks since 1st of September."

William S. Lincoln's Statement.

I exhibit two cows, as competitors for the premium offered

for the two best cows kept with a stock of not less than five. My dairy consists of 6 cows—aged 3, 4, 7, 8, 9 and 11 years—one is 1-4 Ayrshire, and was raised by myself, one supposed part Devon, the rest are called Native, and were raised in different towns in the county. They calved, the 11 year old, early in the spring of 1850, the 8 year old, Feb'y 6, the 9 year old, April 13, the 7 year old, in March, the 4 year old, June 18, and the Heifer, June 20; were turned to pasture May 20th, in what is called *old field*, having no food other than pasture from May 20th to Aug. 15th, since when they have been fed twice a day (while being milked) with corn stalks.

From the first cow, (Sally) during the first *nine days* of June, was drawn 266 lbs. 4 oz. milk, yielding 12 lbs. 9 oz. butter, and during the same days of Sept., 232 lbs. 10 oz. milk, yielding 11 lbs. butter. During the same period of last year, this cow made twenty-nine lbs. 12 oz. butter, showing a loss of 6 lbs. 4 oz.

The second cow yielded during the first *nine days* of June, 298 lbs. 15 oz. milk, from the cream of which was made 13 lbs. 14 oz. butter, and for the same period in Sept. she gave 235 lbs. 9½ oz. milk, producing 9 lbs. 14½ oz. butter.

From the time of turning to pasture (May 20) to June 20th, with two cows, whose yield is given above, 128 lbs. 15½ oz. butter was made. From that period till Sept. 10th, those, with one four year old cow, and the three year old heifer, yielded 309 lbs. 9 oz. butter—making the whole amount produced from the time of turning to pasture to the 10th September, 438 lbs. 8½ oz.

$12 44½ worth of milk and cream was (the milk and cream of the 11 and 9 year old cows having been used in the family) sold in the above period from these cows.

Trial has been made by us of various new and highly lauded churns the past season. All of them possessed, according to the statements of inventors and agents, what was called the highly desirable quality of producing butter in an extremely short time. As yet we have found no churn to be an "*improved one.*" In various trials with the new, side by side with the old "Galt" churn, we have found that there was no short-

ening of time to any considerable amount, and there was in every instance, a less amount of butter produced by the new than the old churn.

[The process of making his butter and the winter management of his cows, are given by Mr. Lincoln, in his statement published in the Transactions of Agricultural Societies for 1850.]

Henry Parker's Statement.

The number of cows kept by me is seven, all of native breed, three of which were raised by myself. Their ages are 2, 3, 6, 7, 9 and 10 years. They were turned to pasture the first day of May, the quality of which is ordinary. "*Stalks*" were fed once a day from the first of September. My youngest cow calved June 20th, and the calf at five weeks and two days old sold for $7 62. We make no cheese, but sell our milk at the door. The cow offered for premium yielded in the first days of June, 360 lbs. 4 oz. milk, producing 17 lbs. 2 oz. butter, and in the first nine days of Sept., 195 lbs. 6 oz. milk, producing 9 1-2 lbs. butter.

In July and August, from six cows during one, and seven during the other month, we sold 2758 quarts, besides having sufficient milk for a family of nine persons.

From my brown cow, in one day in June, we made 2 lbs. butter.

We churn cream, strain the milk into tin pans, and except in the warmest weather, keep it in a room above ground. We keep the cream in a stone pot in the cellar until ready to churn; soak the churn with water over night, put the cream in churn, use a dash churn. Time occupied in churning, in June, five and in September, four minutes.

The most promising calves are raised, others fattened and killed. I keep four swine, feeding, besides refuse of dairy and wash of the house, about 8 quarts cob meal per day. In winter I keep my cows stabled, letting them out about three hours in the middle of the day.

Their food is stock hay and corn stalks, till the 1st of March, then feeding best hay till I turn them to pasture.

Horace Chenery's Statement.

The number of cows kept by me this season is three. The one exhibited is eight years old, of medium size, native breed, raised by Rufus Hastings, of Sterling. The cow calved the 23d of April, was turned out to pasture the first of May, was fed for two weeks subsequently with hay at night, and a half peck of carrots in the morning of each day.

From about the middle of May, no food was furnished her other than pasturing, of an average quality. In the first nine days of June, she gave 404¼ lbs. milk, producing 19 lbs. butter, and in the first nine days of Sept., 298 lbs. of milk and 14 lbs. of butter.

In June, she yielded 1370 1-2 lbs. milk, and the butter produced in the same period was 63 1-4 lbs. From the 1st May to 1st September, she made 205¾ lbs. butter.

We strain the milk into tin pans, letting it stand from 36 to 48 hours. Cream kept in a stone jar till churned.

I have owned her four years, and she has furnished all the milk, butter, and cream for my family averaging eight persons, during that time, excepting two months before calving, but I have sold more milk in the winter than I have bought in the spring.

Asa F. Rice's Statement.

I have four cows, each 8 years old, two of which I exhibit. One is native, raised in Worcester, the other, part Devon, raised in Princeton. The former calved May 20th, the other 26th of Feb. They were turned to pasture May 7th, pasturing common. From 27th Aug., they have been fed "stalks" once a day.

The first cow gave the nine first days of June, 327 lbs. milk, yielding 12 lbs. 5 oz. butter; for the same period in Sept. she gave 218 lbs. milk, yielding 8 lbs. 10 oz. butter.

For the first nine days of June, the second cow gave 254 lbs. milk, yielding 13 lbs. 10 oz. butter, and in the same period in Sept., 146 lbs. milk, yielding 7 lbs. 7 oz. butter. We make no cheese; have used about 280 quarts milk in the family.

We keep the milk down cellar except in cool weather, letting it stand from 36 to 48 hours before skimming.

We strain the milk into a dash churn, churning once a week. The butter is taken from the churn, salted the next day, and worked into lumps.

I have kept seven pigs, giving them nothing but refuse of dairy.

I feed nothing but hay in the winter.

WORCESTER, *Sept.* 1851.

Joseph A. Reed's Statement.

I keep four cows, aged 4, 5, 7, and 8. They were turned to pasture about the 1st of May. The pasture was of average quality, and they have had no food except pasturing.

The cow exhibited is five years old, of mixed Ayrshire, Holderness, and native breeds, and was raised by myself. She calved the 8th day of May.

For the first nine days of June, she gave 377 1-4 lbs. milk, producing 15 lbs. 15 oz. butter, and in September for the same period she gave 209¾ lbs. milk, which made 10 lbs. 14 oz. butter.

Two hundred and sixty-five and a half lbs. butter, and 277 1-2 lbs. cheese, (half new milk and half four meal,) was made from the time of turning to pasture till the 10th September.

I have kept six swine—furnishing them no food save the refuse of the dairy and waste from the house.

My cows calved March 20th, March 29th, May 8th, and June 15th.

The family consisted of seven persons until July. In that and the subsequent month it numbered 15—" which accounts for the small quanity of butter and cheese made from our dairy."

Milk is strained in tin pans on the lower floor of the house, where it stands from 24 to 36 hours; it is then skimmed. The cream is kept in tin pans, and churned in a common crank churn—time occupied in churning from 20 to 30 minutes. Butter is taken from the churn—washed in cold water, butter-milk worked out by hand, and 1 oz. table salt added to 1 lb. of butter.

My cows are stabled in winter—fed at regular hours—let out to water twice a day. In pleasant weather they are left out a few hours in the sun. Their food is hay of ordinary quality, until a short time before calving—from which time until they go to pasture, they are furnished English hay.

PRINCETON, *Sept.* 17, 1851.

Harvey Dodge's Statement.

This cow Flora, was five years old the 1st day of July last, one half Creampot and Durham—has had three calves, the last of which is by her side. Her milk has always been sold. The present calf took one half of her milk the first three months, and the whole for the last three months.

She gave 37 lbs. of milk per day from June to October, in 1849 and 1850. Was raised by myself, and has been kept principally with nine others, without any kind of feed in summer but grass.

SUTTON, *Sept.* 18, 1851.

Sylvanus Sears's Statement.

My dairy is composed of nine cows, of 3, 4, 4, 5, 5, 6, 7, 8 and 9 years respectively. Six of them are of native breed, two half Durham, one part Devon. Six were raised in Worcester county, the rest in New Hampshire.

The cow exhibited is six years old, raised in N. H. She calved 1st June, was turned to pasture 15th May, and for about the last six weeks has had 1 1-2 cwt. corn-fodder daily. In the first nine days of June, she gave 495 1-2 lbs. milk, and during the same time in Sept. she gave 243 1-2 lbs. milk.

I sell all the milk from my cows, and from the time of turning to pasture till Sept., 10th, have sold about 18,000 quarts. Have kept two swine.

WORCESTER, *Sept.* 18, 1851.

HEIFERS.

Thirty heifers were presented, of two years old and upwards; and twenty-eight heifers not less than one, and under two years old. The Durham, Ayrshire and Devon stock, and

their crosses, were fully represented. A. L. Allen, of Shrewsbury, exhibited six fine animals from 14 to 17 1-2 months old, four of which were of the Devon and native, and two of the Devon and Ayrshire breed, promising a valuable dairy. John Brooks, of Princeton, exhibited six fine heifer calves, from four to six months old, half Ayrshire, and of McGregor stock. The committee say, "knowing Mr. Brooks's mode of raising and keeping, they were highly gratified in their examination of these animals, and thought they had good evidence of his skill and judgment in selecting and raising stock for the dairy."

Fat Cattle.

The secret of producing, with the least expense, large and fat cattle, is one of great value, and can only be ascertained by many facts or experiments, and a comparison of the experience of many persons. It is peculiarly an act of experiment, as it is only by experience that we can ascertain what breeds of cattle are best for fatting, and by what mode of feeding and treatment, they may be most easily and cheaply fattened. It is very desirable that a large number of fat cattle should be annually exhibited on this public occasion, where they may be examined, not only by the committee appointed for the purpose, but by numerous farmers and others from all parts of the county, who will have an opportunity of learning under what circumstances, and by what treatment the largest and fattest animals are produced, and thus every farmer is enabled to add to his own, the experience of many others, for his information and improvement.

It is to be hoped, therefore, that on future exhibitions of the society, a larger number of fat cattle will be presented, and that careful and particular accounts in writing shall be given in, of the mode of keeping and fatting them, and any circumstances in relation to them, which may give valuable information to the public.

The fact that a fat ox has been produced weighing 4000 lbs., shows its possibility, and when more shall be known upon this subject, from longer experience and careful observation, we

are now unable to say what can be accomplished in the enlargement of the size, and improvement of the quality of our cattle.

Only five fat oxen were exhibited. There were seven fat cows offered for premiums, which were awarded as follows:

The first premium of ten dollars, to Caleb Nourse, of Bolton, for his dark red cow, five years old, weighing 1720 lbs.

The second premium of six dollars, to Cyrus Gale, of Northborough, for his cow, four years old, weighing 1400 lbs.

The third premium of four dollars, to Asa Matthews, of Worcester, for his red cow, weighing 1300 lbs.

All the cows exhibited were of the native breed, and were fattened without unusual expense.

JOSEPH MASON, *Chairman.*

Poultry.

1. What are the best kinds of poultry to keep?
2. Is it profitable to keep poultry at all?

In answer to the first question, the belief of the committee is, that the kinds of fowls which lay the greatest number of eggs, are the Shanghaes, Guelderlands, Dorkings, Poland and Spanish. The Poland and Spanish fowls lay the largest, but the larger varieties are said to be inferior in flavor to smaller eggs. As to what kinds are really to be preferred, different men differ exceedingly, and isolated opinions depend so much upon each one's isolated experience, that we shall be left in doubt until the subject has been more fully examined and more clearly understood.

This committee will hardly undertake to settle the dispute, and will say briefly upon the question, is it profitable to keep poultry at all; that it is profitable for some persons. For others there is more of fun than profit. If a person is well situated for the purpose, he may readily make it an object for him to keep poultry, in a pecuniary point of view. Commodious room, the right kind of soil—a variety of orts and ends, and a proper system in the management, may make keeping poultry not only

a pleasant but a profitable employment. Far be it from us to discourage it in any instance. That there has been a sort of poultry fever, no one will attempt to deny, but a remedy has been found in many cases in a process of depletion, which has left the dabbler in hens and chickens so well satisfied with the experiment in his own case, that his poultry yard has become permanently empty. There have been fevers in other kinds of business, and a person might as well resolve that he would own no land, because there was once an eastern land fever, as to resolve that he would never keep a hen, because the cravings of a disordered imagination have not been supplied in the matter of poultry. The truth is, keeping poultry is a legitimate business and one which may be made reasonably profitable. Let our people be content with this, and feeding fowls, and raising chickens, and selling eggs, will be reckoned, not only among the most pleasant, but the most honorable employments.

HENRY CHAPIN, *Chairman.*

Agricultural Implements.

The committee, (William S. Barton, Chairman,) say that a hay-spreader was entered for exhibition, by Dr. Boylston, of Princeton; that from the examination they were able to make of this machine, they are quite confident that a similar machine, of *less weight*, of less *complicated* structure, and consequently of less expense, would be a great desideratum among the farmers of this country; and that it is to be hoped that some enterprising *New* England mechanic may improve upon it. The expense of this machine they understand to be about seventy-five dollars.

Ward N. Boylston's Statement.

I offer for exhibition a hay spreader, imported from England, and the only one in this country. The machine runs crossways of the swarths, and spreads the hay lighter, and more even than can be done in the usual way; moreover, it will shake it up much faster than you can rake the same amount up with the horse rake.

The machine, as you see it, is out of geer; to put it in working trim, the two rollers are shoved sideways, and then tightened down by the cap and nut in the middle. My object in purchasing it was to procure some mechanic to make improvements upon it, so that a machine might be made less expensive and lighter, and come within the means of farmers generally. I have used the machine for two summers, on smooth land.

PRINCETON, *Sept.* 16, 1851.

CHEESE.

It has frequently been inquired, whether a cow giving a large supply of milk, not rich in cream, may not be valuable in a cheese dairy, although nearly worthless for the making of butter; and such is often asserted to be the case. It is apprehended that such an opinion is erroneous, if the quality of the cheese is to be regarded. Cream cheese being much more valuable than skim cheese, it is believed that the richest quality of milk is necessary for the making of the best cheese. As the milk of a single cow cannot well be made into cheese for the purpose of testing its good properties for this manufacture, it will doubtless be found expedient to reject all cows, for the use of a cheese dairy, that would not be considered as valuable for the making of butter.

The same degree of skill and attention to cleanliness which is so important in the making of good butter is requisite in the manufacture of cheese. Having provided good living machinery, for the production of the milk, much must then depend upon the food, and treatment of the cows.

It the fourth volume of the Journal of the Royal Agricultural Society of England, is a lecture on the application of physiology to the rearing and feeding of cattle, by Professor Playfair, from which the following is an extract:—"We have now to consider one of the most important branches of feeding cattle, viz., for dairy purposes. Attention to scientific principles in the department of feeding, is likely to lead to the most beneficial results.

"Milk is one of the most important secretions of the body. It has already been stated that it consists of casein, (cheese) butter, sugar of milk, and various earthy and alkaline salts.

"Potash is perfectly indispensable to its formation; indeed this alkali seems to be the means by which the albumen in the body is rendered soluble, and consequently converted into casein. We know little or nothing of the nature of secretions; we only know that certain glands have the power of appropriating particular parts of the organism, as of food, in order to produce fluids, which are either separated from the system, or perform some new functions in it. In the secretions, the chemical forces play an important part, although the peculiar nature of their action is but imperfectly understood. We know, for example, that the albumen contained in the serum of blood may be converted into casein by mixture with a little caustic potash, but we are entirely ignorant how the conversion is effected in the animal economy. Potash is quite indispensable to the formation of milk, and hence it is highly probable that the transformation of albumen into casein proceeds in the way already described; but it does so under the direction of vitality; for we are aware that the composition of the secretion of milk or tears is influenced by nervous and mental affections, as well as by many other causes which tend to alter the state of the vital forces in the body.

"It is a question of some interest, whether the amount of casein in milk is increased by the waste of the tissues of the body? The milk of a cow in the meadow contains more casein than that of a stall fed cow; and I found that the evenings' milk generally contains more casein than milk obtained in the morning. In the first case, the cow in the meadow obtains exercise, and consequently the tissues of the body undergo a certain degree of waste; while in the latter case a similar condition holds, for during the day a cow has more exercise than at night; still these cases might be explained on the supposition that the proportions of butter, sugar of milk, and water in the milk, vary in the different states. But another strong proof of our view is drawn from the composition of the milk of a cow immediately after its parturition. During labor the muscles are

thrown into a violent state of action, which occasions a proportionate waste of the tissues of the body; as parturition generally continues for several hours, the waste of matter in the body is very considerable. Now if this waste of the tissues actually increased the amount of casein in the milk, we should expect to find a notable increase of that body in the milk of a cow which has just calved, and this we know to be the case, for such milk is quite thick with cheese. Boussingault found the composition of the milk of a cow, before the calf had been allowed to suck, as follow:—Casein, 15.0; butter, 2.6; sugar, 3.6; ashes, 0.3; water, 78.5—100.

"Here then we find the milk contained fifteen per cent., of casein, while the milk of the same cow usually contained only three per cent., or one fifth the quantity. I am quite aware that there is some difficulty in conceiving a separation of part of the organism without a destruction of its chemical composition; but in the present state of our knowledge we cannot deny that a separation might take place by a simple alteration of the chemical *nature* of the components of the organism, without a change in composition; thus the alkalies liberated by the destruction of the tissues might possibly convert the albumen in the blood into the casein, and thus the waste of the tissues would indirectly increase the amount of casein in the milk. The cases already cited might be explained on this supposition. We have the more insisted on this point, because by it may be explained several apparently anomalous circumstances in dairy farming.

"It is necessary in dairy farming to use every means to insure the tranquillity of our milch cows. Harsh treatment exerts a very injurious action on the nature of the milk, both from mental and physical causes. Dairymen are well aware of the sad effects which follow, if cows be harrassed by dogs or by harsh keepers.

"The great cause which renders milk *poor*, that is, deprives it of the proper quantity of butter, is the respiration of too great an amount of oxygen. This gas combines so easily with butter that it is of great importance to prevent an excess from entering the body. Now the number of respirations is increased

either by exercise or by external cooling—hence more oxygen in these cases enters the system, and consumes a proportional quantity of the butter of the milk. You all know when a cow runs, on its way home to be milked, that the milk becomes hot and is prone to sourness. The running increases the number of its respirations, and consequently, the amount of oxygen which enters its system. This oxygen unites with the butter, or, in common language, burns it; and the heat produced in the milk is the result of the combustion of the butter. The milk, in such a case, is also reduced in volume; this is partly owing to the evaporation of its water by means of the heat thus produced; hence it is, that such milk is much poorer than usual, and apt to enter into acidity; hence also your practice of driving home to be milked only those cows which feed near home, while those at a distance from it are milked in the field. The amount of oxygen inhaled, being too considerable when the animals are driven from a distance, the butter is partly consumed. To obviate an excessive respiration of oxygen, we find that all good dairymen permit their cows to walk home as leisurely as they themselves will do, and never allow their driver to accelerate their pace.

"A singular system is frequently pursued, which may be explained on this principle. In hot weather in summer, the cows are fed in the stall during the day, and turned out to grass during the night. Cattle are apt to be annoyed by the flies, and by the heat during the day. The former cause them to move about to avoid their attacks, and thus they require a greater amount of oxygen. This oxygen consumes that part of the food which otherwise would have been transformed into butter; but when let out at night, they are not thus disturbed and the darkness prevents their wandering about; thus they obtain exercise sufficient to furnish them with a good appetite, and the butter in the milk is not consumed. On the other hand, if the night proved cold, more injury than good would be experienced by this system, for a greater amount of butter would be destroyed. Stall fed cows furnish the greater proportion of butter, a fact to which we shall again advert. Any deficiency of heat must occasion a combustion of butter to supply the requisite

quantity. On this account we select warm sheltered pastures for our cows, and do not expose them to sudden changes of temperature. When butter is the object desired by our dairymen, too rich pastures cannot be supplied to their cows.

"The production of cheese in the milk involves certain other conditions. I have travelled through the principal cheese districts to acquire information on this point, but the evidence furnished by cheese dairymen is very conflicting, and apparently contradictory. Almost all cheese districts agree in asserting that *poor* land is best adapted for cheese, although there are certain other districts in which the very reverse is affirmed. This arises from the quality of cheese manufactured; those dairies which depend equally upon their butter and their cheese, and prepare the latter principally from skimmed milk, must possess rich pastures fitted principally for butter.

"In poor lands the cows have more ground to traverse, in order to obtain a sufficiency of food, and consequently the oxygen required by the increased exercise compels them to eat a greater quantity. By this increased quantity more cheese (casein,) is furnished to the milk. Land is considered rich, not when its grass abounds in albumen, but when it contains the constituents of food fitted for the production of fat, and if my opinion, formerly expressed, be correct, viz., that the waste of the tissues increases indirectly the amount of casein in the milk, then another reason is given why poor land should be better adapted for the growth of cheese, than that which is rich."

The term *poor*, as applied to land in the foregoing extracts, has only a relative meaning; it cannot be received as having the same signification when applied to the highly cultivated and fertile districts of Great Britain, as when used in relation to the sterile soils of New England. We are informed that pasture lands having luxuriant rank feed, are better adapted for the making of butter; and that the land having short feed, which will induce the cow to make use of considerable exercise to fill herself, is better calculated for the making of cheese. No cow can be expected to yield a full supply of milk, unless she shall have been furnished with a full supply of food, and that of good quality. No degree of starvation of our cows will tend to fill the

shelves in our cheese rooms. We are also instructed of the importance of constant attention to the kind and gentle treatment of our cows, and admonished that we should never allow them to be worried or chased by brutes, whether biped or quadruped.

JOHN W. LINCOLN, *Chairman.*

Wheat and Brome Grass.

After the time allowed for making entries for farms, a letter was received from Benjamin Willard, of Lancaster, stating that he had a handsome field of wheat and a species of a new kind of grass of superior quality, which he was desirous of exhibiting to the committee. In compliance with his request, the committee visited his farm on the 10th day of July last. They were shown a very beautiful field of winter wheat, also one of spring wheat. The spring wheat was uncommonly large, the winter wheat, it was reported, had been much thrown out of the ground by the action of the frost, but had been saved, by having a field roller passed over it, early in the spring.

They then proceeded to a pasture of seven acres, of very light, sandy soil, on which they were informed six young cattle, and thirteen sheep had been kept for the season, and which had been laid down with the seed of brome grass and white clover; much white clover was seen in blossom, and some of the brome grass. The surface was an unbroken turf of good feed, altogether better than is usually seen on such soil. On the interval lands the brome grass was quite tall and very thick, giving a very large yield. The stalks of grass being large, the hay would be coarse, and probably not so good as fine hay; and there would be much waste, unless cut with a machine; whether it would then be profitable, must depend upon the proportion of nutritive matter in the grass. The brome grass, (botanically *bromus*) is of a large genus of grasses having numerous species, most of which are annuals, is indigenous in Great Britain, and is described by their writers on grasses as a *weed*, which is not relished by cattle. They state that "it has for a considerable time, been in

great request for lawns, upon arid soils, for it forms as thorough mat or sward as rye grass, and powerfully resists the bad effects of aridity. Yet though comparatively an unproductive grass, it possesses several recommendations to the store farmer; it affords a little early food to sheep, it does not strike deep root, and it readily and without aid from man, propagates itself from its seed." *Cheat* or *chess* is of this family.

Rural Encyclopædia, vol. 2, page 505, under the head of grasses, says, "some grasses which yield great bulk of produce and possess considerable or even large proportion of nutritiveness, are hastily condemned by multitudes of farmers on account of their coarse appearance. Cattle select their food by an instinctive recognition of wholesomeness, universally and most benignly conferred on them by the all benevolent Creator; and they treat grasses, not at all according to their appearance, but wholly according to their odor, their flavor, and their intrinsic properties; but unreflecting farmers select, or approve, the herbage of their farms almost wholly by the eye, and are liable to reject with scorn any newly imported grass which seems any way akin in bulk or massiveness to the bulrushes or the sedges. "I have often observed, in showing even very intelligent farmers my collection of grasses," says Mr. Gorrie, of Annat, "that if any species sheweth strength of stem, with luxuriance of herbage, and consequently promising extraordinary weight of forage, that species was without hesitation pronounced coarse and unworthy of further attention, till the opinion of a horse or a cow, as a qualified reference, was taken on the subject."

What would be the verdict of a jury of cows on the qualities of this brome grass, the committee have no means of knowing. If in their judgment they confirm the opinion of Mr. Willard as to the superiority of this grass, then will the agricultural community owe him a large debt of gratitude for having introduced to notice here, a species of grass which is highly beneficial on light sandy soils, much superior to any other species, and producing most abundantly on land of better quality. But if that jury shall not *relish* the evidence laid before them, the introduction of this grass will not be unattended with benefit, not only on the poor lands before mentioned, but will be highly

useful in sowing the slopes of the various railroad embankments and excavations on the numerous routes through our country. This grass appears well adapted for this purpose; it would readily grow in those situations, thus saving the corporations much expense from repairing the banks, occasioned by washing of the rains, which it would prevent, and would convert the unsightly object of barren earth, to the pleasant view of a handsome green sward. The committee, with such evidence as they have been able to obtain, are in doubt whether to recommend this as a valuable grass except for railroad purposes, or to condemn it as has been done by some English writers, as a *weed.* They would solicit from those who have made a trial of it, a statement of the results of their experiments.

The farm of Mr. Willard, so far as seen by the committee, appeared highly productive, the crops being large, giving evidence of good cultivation.

JOHN W. LINCOLN,
JAMES ESTABROOK,
HARVEY DODGE.

Committee on Farms.

Benjamin Willard's Statement.

My winter wheat was raised from six quarts obtained of a friend, brought by him from the far west; said to yield a heavy, beautiful crop, and to be always free from smut, blight, and weevil, neither of which have I seen on a single head or straw. My six quarts sown Sept. 1849, gave me 6 1-2 bushels, fair as the original seed. Of this I sowed 2 1-2 bushels on a two acre home lot, part after early dug potatoes, August 30; part after corn, Sept. 9th; 1 bushel on a summer fallow of light pasture land, Sept. 24, 1850. Part of the seed was steeped in strong brine with no perceptible difference afterwards. The fallow (one acre) was cut Aug. 17th. It gave me 20 bushels, for one sown. The other was cut too late, the 26th, being ripe; but part of it is thrashed. I think 50 bushels a safe estimate for the home lot. It was taller, heavier, and equally

fair, though considerably injured by being thrown up by the frost in March, (but pressed in immediately with a roller.) I reckon this the most profitable crop I ever raised with the same outlay. Equally sure from this seed as rye or corn. On the 29th of Aug. last, I sowed three bushels on the inverted sod, with a top dressing of compost and grass seed, which now look well. I intend to sow my corn and potato ground, as soon as I can clear it, with this wheat in preference to spring grain. I get better grass when sown in autumn (nature's time) and after wheat.

As to my bromus grass, some fears and prejudice have been expressed concerning it, and the circulation has been limited by the pledge I have taken of purchasers, not to dispose of any of the seed had of me, or raised from it. I have preferred to make the fullest experiment on my own soil and in various times of sowing, and for different purposes. I can now say, as far as I can learn from others and my own use of it, it proves to be a valuable accession to our cultivated grasses. As a fertilizer being richer feed, and growing quicker for pasture than any other, on land capable of being ploughed. As adapted to summer soiling from its heavy growth, and for hay, especially when sowed with red clover, which is held up by its elasticity and cannot lodge so as to be slippery or bad to mow; and rank as it grows, cattle, horses, and sheep prefer it to any other, green or dry. Though it likes a rich moist soil, and a top dressing of plaster and ashes, as well as clover, it will come up and resist the drought on gravelly pine plain, covering the ground, retaining the dew, and protecting finer grasses until they get rooted and form a green sward.

Besides a large quantity for hay and pasture, I sowed six acres of bromus last autumn, and allowed it to ripen, which is now secure in sheaf for seed. I might as well have taken 120 bushels of wheat from the same soil, and should have done so, but for a wish to meet the demands for its extended circulation, which no other can do at present. My wish is to have every bushel I can spare, taken without restriction, and sown before the ground closes again, and the advantage of this prolific grass, be shared by every applicant. If sowing bromus grass

is deferred till spring, a crop rich in proportion to the soil will be grown, but no seed till a year later.

LANCASTER, *Sept.* 11, 1851.

COMPOST MANURES.

T. & J. S. Merriam's Statement.

We have a cellar under our barn (which every farmer ought to have even if his stock consist of only one cow), for one load of manure made under a barn is worth two made out in the open air, exposed to sun and rain. After cleaning out the manure from the barn and hog yards, we cart a quantity of *swamp mud* into our barn yard, and *loam* into the hog yard; and in the spring before planting, we cart our hog manure to our barn yard, and gather all our manure, as much as possible, under the barn and mix it as much as we can, at the same time mixing in plaster sufficient to keep the ammonia in, then shovel it over, mixing and pulverizing it as much as possible, after which we let it lay a few days before applying it to the field. In the same way we prepare our manure again early in the fall for our grass lands with the addition of leached ashes (if we can obtain them reasonably.) We keep our oxen and horses in the barn to hay all summer.

We also have another method of preparing manure in the spring which we call guano; we generally gather from our dove house about thirty bushels of manure which we mix with swamp mud and plaster, putting six or seven bushels of dove manure and four or five hundred of plaster to a large cart buck full of swamp mud and mixing them well together.

For planting, we take up green sward every year, spreading the manure on the grass before ploughing; we keep a team carting, a man spreading, and another team following with the plough, turning it in as soon as it is spread; then we follow the plough with the roller and harrow. To prepare the ground for planting we do not furrow at all; we mark out our grounds with chains attached to a pole, then we drop our corn and put

on a small handful of our own made guano to the hill and cover.

We apply our manure to our grass land in two ways, one by turning the land over with the plough in August or Sept., where the ground is such that we can, and put the manure on the top, sow the grass seed, then harrow and roll it. This we think the best way, as we get a good crop the first year; but where the land is too wet to plough, we spread it on the top as early in the fall as we can. In all cases we want to get out our mud and let it lay in one pile as long as one year at least, before using, and if it should lay longer it would be the better. We consider the scrapings of the wood shed and yard, one of the very best articles to put into the hog yard to mix with the loam.

Auburn, *Dec.* 17, 1851.

Root Crops.

Seasonable entries were made by Harvey Dodge of Sutton, for 1-2 acre, and 1-4 acre of carrots, and 1-4 acre of ruta bagas, by William S. Lincoln, for 1-2 and 1-4 acre of carrots and 1-4 acre sugar beet. The season in this section of the country had been unusually dry, which had greatly affected these crops. It is much to be regretted that more entries for these premiums had not been made. Roots, particularly carrots, were grown very successfully in other parts of the county, and it was expected that other entries would have been received.

Mr. Lincoln stated to the committee, that he had noticed in cases where the rows of the root crops were in a north and a south direction, the roots had suffered more from a blast which had injured them, than in those cases, in which the rows were in an east and west direction; that his observation was of the present and past years: that he had conversed with others, on the subject, and their experience coincided with his. The fact was new to the committee, and is now mentioned for the purpose of requesting information from others of their knowledge in relation to this subject. The committee, desirous of viewing

other fields of roots, that they might the better understand the claims of the competitors, stopped on their return from Sutton, at the farm of the chairman, to view a carrot crop growing on land which had borne the same crop for five consecutive years, each year having more than an average burden. From the appearance of the tops and the roots which they raised, they believed the yield would be considerably greater than any they had seen. The chairman was present when these carrots were being harvested. He was shown a root which had just been raised which measured from its crown, or the place of separation of the leaves and the root, to its extremity, as it then was, over two feet. The root had evidently been broken off; what was its true length in the ground, when whole, he is ignorant. The fact is now stated, as affording evidence of the expediency of deep culture. Some six years since the land was in grass, but being desirous of preparing the ground for a fruit orchard, the land was ploughed deep by a common plough, followed by a subsoil plough, and five years since, fruit trees were set out, and the land has since been constantly under cultivation, and on the greater part thereof, carrots have been grown each year.

The committee also viewed the crop of carrots of Mr. Hammond, one of the committee, which was also grown in an orchard of young bearing trees, which promised a greater yield than did those of the competitors.

It is understood that a member of this society in the town of Bolton, who has cultivated this crop largely in former years, had the present year six acres in carrots, and considers their culture as quite profitable; he sells a considerable part of these roots to livery stable keepers for the use of their horses, and they are much desired by them.

Believing that the value of this crop is not duly appreciated by members of the society, for the use of their stock, the following evidence is offered to this point.

Carrots *vs.* Oats.—We have had twenty communications from various sources, all of which concur in saying that a peck of carrots will, with the same quantity of hay, keep working horses in as good condition, and many say better, than a peck of oats, and a like quantity of hay; or that a peck of carrots

and a peck of oats, are equal to a half bushel of oats. Sixty bushels of oats and nine hundred bushels of carrots are large crops."

"Say, to raise carrots, you plough your land once oftener than for oats, at a high allowance for men and team, ...		$2 50
Say it takes twelve days' labor to hoe the crop three times, and four days' labor to harvest the crop, sixteen days at 75 cents, ...		12 00
Say additional manure for carrots, which however leaves the land richer, ...		10 50
		$25 00
Say then, you raise only 500 bushels of carrots per acre, at 35 cents, . .	$175 00	
Deduct extra cost of cultivation, .	25 00	150 00
Say you raise 40 bushels of oats per acre, place the seed of the two as equal, and that the straw of the oats pays for harvesting and threshing, and you have 35 cents per bushel, ...	14 00	
One hundred thirty-six dollars clear gain, if you feed your carrots to your own horses and cows. Then strike off half again, and reduce your carrots to 250 bushels, and still you have $68 against $14."		

Plough, Loom and the Anvil, June, 1851.

Carrots for Horses.—"It is admitted by every one who is at all acquainted with the great nutritive qualities of the carrot, that as a winter food for horses, to use in small quantities daily,—say half a peck to each horse, with their dry food, and especially in the absence of green provender, is of the utmost value. It not only possesses fattening properties equal to oats, taking bushel for bushel, but it secures to the horses, in winter season, fine health, a loose skin, and a glossy coat of hair, which it is impossible to produce except by the use of the carrot.

"To those keeping horses, who do not raise their own carrots, we would hint that now is the time to procure a supply,

while they are being harvested. About twelve bushels to a horse, would be sufficient."—*Germantown Telegraph.*

The chairman can state from his own experience of several years, that the use of carrots for cattle or swine is not less beneficial than for horses.

From Mr. Dodge a statement has been received, by which it appears that on one of his carrot fields, the crop was at the rate of 568 bushels per acre, on the other at the rate of 503½ bushels per acre: his ruta bagas yielded at the rate of 516 bushels per acre. The committee believe those results are below the average crops of former years. They doubt the propriety or expediency of awarding premiums for any crops for which the yield is below a common average: and they have omitted doing so in these cases. A communication from Mr. Lincoln has been received, stating the failure of his crops, and that he had omitted to measure the small return which he had received from his land.

No entry in relation to potatoes has been made. The rot has not been so injurious, as it was the last year, but has prevailed for so many years, that less of that root is now raised than in former years. During the last spring, the chairman received the following letter:—

Mr. Lincoln,

Sir,—Yours of the 10th is received. I am not a farmer, but a mechanic, and till a garden, the potatoes in which, have at times rotted. Last year it was mentioned at table one day, that the rot had commenced, the tops were dying. My wife, whose father is a farmer, and who is rather philosophical, said "apply slacked lime;" the idea did not strike me favorably, and a gentleman of considerable information present, coincided in my views. Mrs. Wing, however, nothing discouraged, ordered the little boys to put some on every hill; considering the disease to be atmospheric, and the leaves or tops the organs, she thought to absorb and thereby check the disease before it reached the root. The result, I think, must have been beyond her most sanguine expectations. New sprouts came out on the decayed tops, and they assumed a vigorous appearance, and re-

mained thrifty. Four hills which were planted a little aside, and overlooked by the boys, rotted entirely. This was our experiment, and the results thereof I have no wish to withhold from the community; you are at liberty to make what use of it you think proper. My wife suggests the propriety of an earlier application, repeated in small quantities.

Yours respectfully,

E. WING.

West Goshen, Conn., *May* 13, 1851.

The application of slacked lime to potatoes is not new with Mr. Wing; a farmer in a neighboring town has informed the chairman, that he has for several years used lime successfully as a preventive to the potato rot; he applied it when planting the root. It is hoped that the farmers of our county will make the trial of lime both as a preventive and as a remedy for the potato rot. It will be attended with little trouble or cost, and if it should fail to benefit the potato crop, it will do the land no injury: if it should prove successful, a great blessing will be secured to the country. They will not fail to remember that the results of all such experiments, whether they prove for good or for ill, should be communicated to the public.

JOHN W. LINCOLN, *Chairman.*

Harvey Dodge's Statement.

In my account with my carrot fields, no manure is carried to the credit of a future crop, as has been the practice with me in former years, it being a matter of some doubt how much should be credited for the next crop. The committee will no doubt understand by what they saw when here, that the young apple trees of four and five years growth, on the two lots on which the carrots were growing, were claiming a large share of my attention, and the question may be asked, why do you not grow from eight to ten hundred bushels instead of the crops reported this year and last? To this I would answer, that the growth of trees added to 550 bushels would equal in value a crop of carrots of eight hundred bushels per acre.

I see no cause for altering the opinion, that carrots may be more profitably produced on the same land for a succession of years. First, because the land is thereby cleansed from all noxious weeds the first season, and being worked with the subsoil plough or spade deeper than most of our farmers can afford to work their whole farm, the ground is more easily worked and cleansed in all after years; and if long or whole manure is used, say the droppings in the stable from a well fed stock, (which if permitted to remain in the barn cellar until after the carrots are cleared off, being almost one year old, cannot and does not contain weed seed,) if we do not find all the weeds the first season we should the next. All composts for the root crop of any kind should be avoided, as I believe them friendly to weeds of all kinds. "The ashes of the carrot are, per cent. potash and soda, 45; lime, 10; sulphuric acid, 2.7; phosphoric acid, 5.14," so says the Farmer's Dictionary. "Hence ashes, common salt and gypsum are eminently useful as manures;" an abundance of well rotted leaves and muck should be added.

Carrots have been grown to a greater extent in Sutton the present year than in any previous year, and all seem satisfied that they have no better crop; yet I have found no one that could tell any thing about their *cost* or *worth* per bushel. The manufacturer of cotton can tell you to a fraction the cost of his fabric and the precise number of picks to the inch in a yard of his cloth, without any aid in way of premiums for his labor; he knows whether he is making a loss or gain from his establishment. Not so with the farmer. A liberal premium has been offered by our Agricultural Society for several years to determine the *cost* of production and the *true value* of the crop for consumption, as well as the best modes of cultivation, and I believe that some advances have been made.

But still Mr. A., in the consumption of his crop, happening to be in possession of one of Pharaoh's ill-favored and lean kine, determines to put him to feeding on these roots. The result proves a bad one, and he throws the whole root tribe overboard; while Mr. B. works his help, weeding and hoeing between showers and before breakfast, while the tops are wet. His men complain, and his crop is injured, and he concludes it

is too troublesome a job for him and gives it up. While Mr. C., more of a thinking man, works himself or men under cover during wet weather, and works his carrot ground *only* when the sun shines, so that the weeds may all perish before any moisture can come to their aid, and this is the end of weeds for this dressing. Hoeing his ground so soon after the seed is sown, but few weeds ever start. Mr. C. concludes that he can do no better business than to grow, from year to year, a suitable quantity of roots to meet his wants. Mr. C. is a good natured man, and trusts firmly in the doctrine that "seed time and harvest shall never fail;" calling his men and boys at ten o'clock in the morning he takes them under the shade of a favorite tree and gives them a wholesome lunch (no grog), and then says, Come boys let us now go and look after the weeds whilst the dew is off; then he takes them back to the corn or potato field without any loss of time. At harvest he reports his crop and obtains the premium. He is surprised with the result himself, while Mr. A. and Mr. B. stand afar off, and either cry out sour grapes, or it is naught, it is naught. Would not our society be as much benefited by a report from Mr. A. and Mr. B., as by one from Mr. C.?

The ruta baga crop entered for the society's premium was harvested this day, Nov. 18th, and 129 bushels were pulled, topped and carted to the cellar in three hours by four men and two boys with the aid of a yoke of oxen and cart. One fourth of an acre was surveyed and the result was as above. This was nothing more than an average quarter from a field of several acres which has been recently reclaimed from a bad unsightly pasture, said to have been worth in the fall of 1849, $17 per acre, and this by a former member of your committee; this appraisal was when the soil was about being disturbed from its native slumbers for the first time.

Underdrainage was commenced on this land in the fall of 1849, and ditches of three feet wide and two and a half feet deep were cut at the rate of about 250 rods to the acre, and filled with stones taken from the field. The land was first ploughed in the fall of 1849, and has been worked with the plough and harrow, up to June, 1851, but no crop was taken from it until the present year, as it was not sufficiently subdued to receive a

crop. In October, 1850, manure from the hogpen, of the first quality, (a considerable quantity of small bones being in its composition,) at the rate of 40 loads per acre, was carted upon the land and immediately ploughed under. Nothing more was done to the land until last June, when it was ploughed and prepared for a turnip crop. The seed sown the 3d of July, full twenty days too soon, in rows about twelve inches apart. But very few weeds ever started. This crop was thinned the first of August, and no hoeing was necessary, or weeding of any amount, as no crop of weeds had been grown on the land.

	TURNIP FIELD,	DR.
1850.—Oct.	To ten loads of manure, . .	$10 00
1851.—June.	Ploughing and harrowing land twice,	1 00
July 3.	To ¼ lb. Scriving's imported Ruta-baga seed and sowing, . .	75
Aug. 1.	Thinning, one hand one day, .	1 00
Nov. 17.	Harvesting and storing . .	1 50
	Interest on land, at $200 per acre,	3 00
		$17 25

	CONTRA,	CR.
1851.—Nov. 17.	By 129 bushels of ruta bagas at 25 cents per bushel, for table use,	$32 29

"Brassica Rapa."—This turnip seed was raised by Mr. Scriving, near Liverpool, England, and is what he claims to be, his improved ruta baga. This is the first crop ever raised in this country to my knowledge. Its form and appearance closely resemble the ruta baga that we have been growing the last dozen years. The only important difference is that this shows no disposition to go to seed before harvest, and the stem and top as well as roots are at least 75 per cent. less than on the old variety. This has no strong taste like the old, and is heavier in proportion to its bulk. As I have no knowledge of Mr. Scriving's method of improving turnip, I shall not attempt to speak, though I have no doubt of its being originally of the Swedish family.

Last spring, four of what I esteemed the best varieties were set out in rows three feet apart for seed ; and I was completely successful in changing the color and form by mixing the seed in the blossom. You will recollect the crop of corn growing when your committee were here, on about one and a half acres, below the road. On this lot, and of this variety we harvested the 1st of November, over six hundred bushels, and the quality cannot be improved for table use.

I cannot retract anything I said last year, in relation to the traffic and the importance of importing our turnip seed, being satisfied from longer experience, that if we wish to raise good crops of good roots, we must have good seed from good sorts, and not that produced by an annual, when it should have come from a biennial.

Sutton. *Nov.* 18, 1851.

William S. Lincoln's Statement.

Below you will find an apology for not rendering to you a full report of the carrot and beet crop entered by me for the society's premiums. On the 12th of May I commenced ploughing for these crops ; and on the 25th, the manure being ploughed in, and the soil thoroughly pulverized and hand raked, the seed was sowed.

The 2d day of June, previous to the appearance of the young plants, the ground between the rows was worked over by a light harrow, made for the purpose. The successive weedings were done in a seasonable time, and the labor of hoeing and weeding completed on the 30th of July.

Up to this period there was promise of a superior crop. The distance between the rows was from twelve to fourteen inches, the plants were thick, the foliage vigorous and of a deep green.

The society's books show that at this date my entry was made. Had I deferred the entry a few days I should not have made it all, as, within a fortnight from this time, the whole appearance of the crop changed. The deep green of the carrot tops was changed to a yellow and then to a brown color. The crop was blighted; and in a few days the tops decayed and hardly a green leaf was visible. The field bore this burnt appearance during the continuance of the drouth.

The first rain gave life to what seemed to be dying. Vegetation started anew, but the season was too far advanced to admit hope of a fair crop. No exact account of the produce was taken as it was believed the yield would be much below a fair one. Still I can say, with confidence, that poor as the crop was, it more than repaid all expenses properly chargeable to it.

The same statement will apply to the crop of sugar beets of over a quarter acre, save that the leaves of these roots were affected by the drouth rather than by any disease.

Worcester, *Nov.* 1851.

HAMPSHIRE, FRANKLIN, AND HAMPDEN AGRICULTURAL SOCIETY.

The annual cattle show and fair of this society were held at Northampton, on Wednesday and Thursday, the 8th and 9th of September last.

The ploughing match was unequalled by any similar exhibition within our knowledge. It came off at 2 o'clock, on the first day of the show, on a large, flat and beautiful piece of land, about a mile from the town, which belongs to Elisha Graves, and is known by the name of "The Nook." And truly it is a nook, one of the finest in Massachusetts. Standing on the fertile field where the match took place, the view is charming. In the distance rises in bold relief the hoary head of Mount Holyoke, with its clustering trees and beautiful foliage, and on its highest summit, peering through the variegated colors of the changing forest leaves, is seen the mountain house, a place of rest for travellers; while at the foot of the mount runs the Connecticut, flowing onwards with its pure placid stream, to mingle its waters with the mighty ocean. Thirty-two teams entered the contest, and unusual interest was felt in the result. Ploughs from three different manufacturers, Prouty & Mears; Ruggles, Nourse & Mason, and Whittemore, of Chicopee, were in competition for superiority. There was also another plough, which was new in this county, with a double share, called the Michigan plough. It is virtually two ploughs in one, the first plough or share turning over the turf, and the second stirring up the subsoil. It pulverized the soil equal, if not superior, to the spade.

The show of cattle was not large, nor so good as this county should present. The whole number of entries was one hundred and sixty-two, of which nine were of fat cattle, ten of bulls, and fifteen of milch cows. In young cattle a very decided improvement was noticed over former years. Three

town teams were presented, thirty yoke from South Hadley, twenty-five from Hadley, and twenty-five from East Hampton. The horse show took place on Thursday morning, at which not far from one hundred animals were presented for examination. Some of them were very superior, and the show as a whole was probably better than any previous one.

The exhibition of articles of domestic manufacture, of fruits and vegetables, and of bread, butter and cheese, was held in the town hall, which was arranged with four tables running the whole length, and which afforded ample room for the crowds of people who visited it during both days of the Fair. In the evening it was brilliantly lighted, and at intervals enlivened with music. The fair in the hall was not equal to what it has heretofore been, with the exception of fruit, of which there were numerous specimens exhibited.

The address was delivered by Dr. Daniel Lee, of Rochester, N. Y.

Ploughing Match.

The number of teams entered for the ploughing was forty-one; thirty-two appeared upon the ground, and engaged in the contest.

On account of the land being dry and hard, it was more difficult to plough than on most former years. The lots were so uniformly ploughed, and the work was so satisfactorily done, that it was almost impossible to determine which was entitled to the highest commendation. The committee was highly gratified in observing the perfect order and discipline that pervaded the entire field.

The number of horse teams was twenty-seven. Five of the lots ploughed by them were decided not to be entitled to a premium, being of less depth of furrow than is required by the rules of the society. Premiums were awarded as follows:—

Wm. Strong, of Northampton, - - -	$8 00
Giles E. Smith, of Hadley, - - - -	7 00
George Dickinson, " - - - -	6 00

Theodore Bartlett, Northampton, - - -	$5 00
H. K. Starkweather, " - - -	4 00
Alfred H. Cook, Hadley, - - - -	3 00
Elisha Strong, Northampton, - - -	2 00
Enos Clark, " - - - -	1 00

Three single ox teams ploughed in the contest, and one was excluded for not ploughing the depth required. The committee award on ox teams,

William P. Dickinson, Hadley, - - -	$8 00
William Clark, Jr., Northampton, - - -	6 00

Two other teams appeared and ploughed, one a double team, and the other a single pair of oxen, both having the *double share ploughs.* The experiment being new, involved the question of the right of these ploughs to compete for premium with the other ploughs, a question which the committee felt unwilling to decide. They would remark, however, that the work was very satisfactorily done, and they therefore recommend a gratuity of $5 each, to

Moses Stebbins, of South Deerfield, and
Samuel L. Parsons of Northampton.

There were a number of entries for ploughing without holders. There not being a sufficient number of lots provided for the purpose, that part of the trial was dispensed with.

JOSEPH SMITH, *Chairman.*

STOCK.

Had the duties of your committee devolved on them at an earlier period of our agricultural history, when there was but a slender acquaintance with the different kinds of stock, when the importation of foreign breeds was of rare occurrence, and specimens were in few hands, it might have been desirable, with a view to kindle enterprise, and promote their more frequent introduction, to have described their several characteristics, to have pointed out their respective merits, to have speci-

fied their individual or peculiar adaptation to particular uses, and their comparative claims to special patronage or favor. But in the present day, such is the general dissemination of agricultural science, through the numerous foreign and native publications, on this subject, and such the consequent diffusion of knowledge, that it would be a needless consumption of time to dilate on these topics. Under these circumstances, your committee will at once proceed to give the result of their investigations, embodying the reports of the several committees on different kinds of stock.

Working Oxen.—Twenty three pairs of working oxen were entered for premiums. Some of the cattle were of superior quality, but in several instances, they were ineligible for premiums; for although they had among them many cattle of large dimensions, they were very *unequally*, we might add, *incongruously* associated; we cannot say *matched*, for they harmonized neither in size, figure, or quality. They were *coupled*, but certainly not *paired*.

Five pairs of oxen were exhibited by Parsons West, of Hadley. They added much to the show, being large oxen; three of the pairs were of fine quality, and admirably matched. In respect of these, the committee recommend him a gratuity of $3.

Fat Cattle.—Of fat cattle, the number was much greater, and the quality far superior to those of former years, nine pairs being exhibited. But among their worthy compeers, stood proudly forth the two pairs of Moses Stebbins, of South Deerfield. In the language of the poet Spenser,

"They all their peers in beauty did surpass."

They were of most perfect symmetry, and superior handling properties, of the Durham breed, five years old; one pair weighed 4507 pounds, the other 4280 pounds. The committee award the first premium of $8, to Moses Stebbins.

On Bulls.—The committee award the first premium of $8 to George A. Moore, of Southampton, for his Durham bull. He is three years and three weeks old, and his weight is 1850 pounds.

His precise breed is three parts Durham, and the remainder native. His symmetry is so nearly perfect, that it would savor more of invidiousness than fine discrimination to attempt to point out any faults.

The second premium of $6 was awarded to Paoli Lathrop, of South Hadley Falls, for his fine animal of the Durham breed.

The third premium of $4 to John L. Clark, of Northampton. This is also a Durham.

Steers.—Among the two-year olds, were a pair of very fine Durham steers belonging to Hervey Judd, of South Hadley, weighing 2870 pounds.

Such steers as these rarely gratify the eyes of the farmer. There were also three pairs highly deserving of special notice, belonging to Mr. May of Conway, comprising one yoke four years old, weighing 3670 pounds, one pair, three years old, weighing 3240 pounds, and one pair of two years old, weighing 2442 pounds.

The committee award the first premium of $6, to Hervey Judd, of South Hadley.

The second, of $4, to Cephas May, of Conway.

Cows and Heifers.—Of cows and heifers in milch, there was a good show. No fewer than twenty were on exhibition. Many statements were made. This is absolutely necessary to enable the committee properly to discharge their functions.

The committee award the first premium of $8 to W. A. Arnold, for his cow. She is a very valuable animal, yielding in three weeks, forty-nine pounds of butter, being a weekly average of upwards of sixteen pounds.

The second premium of $7, to Samuel Bartlett, of Hatfield.

The third of $6, to John W. Wilson, of Northampton.

The beautiful Hereford heifer, two years and nine months old, presented by Dr. Daniel Thompson, well deserves the premium awarded to her; and the eight yearling animals, offered by Benjamin Coit, of Norwich, yield much credit to their breeder, as also does the beautiful heifer, thirteen months old, presented by T. G. Huntington, of Hadley.

JOHN EDEN, *Chairman.*

W. A. Arnold's Statement.

Cow seven years old. Calved September 13th. From Wednesday morning, September 17th, to Tuesday evening, September 23d, she gave 111½ quarts strained milk, beer or milk measure. The second week, ending Tuesday evening, September 30, she gave 113 quarts strained milk of the same measure; the third week, ending Tuesday evening, October 7, she gave 108¼ quarts strained milk, of same measure. As we sell a portion of the milk, we adopted the following method to ascertain how much butter she would make in a week. We set invariably two quarts of milk in each pan, and kept an account of the number of pans that were skimmed. The first week took the cream from twelve pans, or twenty-four quarts of milk, which made three pounds, and seven ounces butter, which is at the rate of fifteen pounds, and fifteen and one-half ounces, from one hundred eleven and one-half quarts, or one week's milk. The second week took the cream from thirteen pans, or twenty-six quarts of milk, which made three pounds and twelve ounces butter, at the rate of sixteen pounds and four ounces for one hundred and thirteen quarts, or one week's milk. Third week, took cream from sixteen pans, or thirty-two quarts milk, and made four pounds and fifteen ounces butter, which, from one hundred and eight and one-fourth quarts, or one week's milk, would make sixteen pounds and eleven and one-fourth ounces.

Feed.—Pasturing, two quarts meal, and two pumpkins, per day.

Northampton, *Oct.* 8, 1851.

John W. Wilson's Statement.

I offer my red cow, four years old, to your consideration.

She calved 4th September, 1850. Sold the calf at five and a half weeks old. Weighed, dressed, one hundred and two pounds.

Kept account of milk and butter, from October 11, 1850, to October 8, 1851; gave 3536 quarts, which is an average of a fraction over nine and three quarters quarts per day, during three hundred and sixty-two days.

Butter made during the above time, two hundred and eleven pounds ten ounces. Milk sold and used during that period,

1526 quarts. She is now giving six and a half quarts per day, and is to calve on the 1st of March, 1852; from a pure North Devon bull.

Feed as follows: the cow went to pasture last fall, September 5th. From 14th November to 8th June, she was kept in the barn and fed on second crop hay, and two quarts shorts, or bran, morning and evening. From 8th June to 20th September last, she went to the same pasture, and had nothing but the grass she got in the pasture. Was driven to and from the pasture every day, making a distance of about three miles, and stood in the barn without food at night.

NORTHAMPTON, *Oct.* 1851.

HORSES.

England has paid more attention to the breeding of horses than all other countries together, it is said, and unquestionably she has the best stock for the various useful purposes for which they are bred. And all the countries of the globe which are peculiar for their horses, have contributed to *this* "glory of England." Their breeding and rearing have been carefully and perseveringly attended to, and it is only by breeding and rearing with care, that perfection, or anything approaching it, can be expected in this country.

Formerly, the Spanish Andalusian horses, (sometimes called the handsomest and swiftest in the world,) were numerously imported into England. And those world-famed Arabians from Mocha and the borders of the straits to the Red Sea, so swift, so mettlesome, so gazelle-like, and perfect under the saddle, have been sought to add to her glory.

Hungary has for generations produced mouse-colored horses more sought after for cavalry use, and by military officers, than any other horses raised in all Europe. A late extensive traveller in South America, and a good judge of horses, says, in the large cities of Peru, he has seen finer stables of livery horses, than are to be met with in any other country. This is owing to the fact that Pizarro and his Spanish soldiers took with them there, many

fine Andalusian steeds. And the old Californians upon their immense estates can boast of horses by thousands, and many are splendid ones, and the fine Spanish blood can be traced in them. It is plain that this fine stock is not the result of accident alone.

It is to the rearing and breeding that we wish to urge the attention of every farmer. Too much cannot be said about the choice of your *stallion.* He should be not only of a known prime stock, but he should be in *himself* a horse, having all the points of a perfect animal, and then you may look for a valuable colt. If you have a good mare, (if you have none, get one,) let her bring you a colt from the best horse that can be found within one hundred miles, and then you will be likely to have a good colt that is a "regular colt." Then rear him with care, and be not too anxious to give him that execrable winter hardening, so common among farmers, and described by the chairman of this committee, last year. Give him good food and comfortable quarters, and his rapidly increasing value will reward you.

It would be profitable for many in our hill towns to purchase and keep mares for breeding only, yet it is hardly to be hoped at this time to persuade many to make this more than a secondary object, letting such mares as they may have produce a colt occasionally. But if farmers who keep a team for farm, for church, for market, or for town, would select a good mare and let her bring a colt each year, we know in a short time they will have upon their farm some fine animals, of which they will be truly proud. Give attention to the main points, and to realize high prices will not be difficult, while good marketable horses are daily bringing from one hundred to one thousand dollars.

The first premium for stallions, was awarded to Moses D. Parks, Montgomery.

Longley's "Kentucky Hunter" was on the ground for exhibition, and attracted universal admiration, and no stallion can be more worthy of the attention of farmers. His young stock exhibited with him was faultless, and of his older colts, a gelding was shown and added much credit to his sire. We believe

Longley's and Parks's horses cannot be excelled as breeders. All who exhibit stallions another year, are urged to show as many of their colts with them as possible.

H. I. HODGES, *Chairman.*

Poultry.

The exhibition of barnyard fowls was larger, and altogether more interesting, than at any time previous. The whole number of entries was thirty, embracing two hundred and eighteen fowls; of which there were eighty-four entered as pure Shanghaes, many of them very fine specimens, and perhaps nearly as many more of mixed breeds—partly Shanghae. There were a few good specimens of Dorkings, Polands, and Bantams, and one fine lot of the Plymouth Rock variety. There were also one lot of Capons, and one pair of the English game fowls. Of the pure native breeds, there were none. This omission was regretted, because we incline to think that the old sorts have not had justice done them.

Interesting statements have been received from Messrs. J. W. Wilson and John Eden, of Northampton, and Rev. J. H. Temple, of Whately, the substance of which, respectively, is presented as follows:

Mr. Wilson, referring to his specimens of white and red Shanghae and Dorking fowls, says, the oldest Shanghaes were hatched on the 17th of last April, and the Dorkings on the 29th of April and 14th of July. One of the April Shanghaes commenced laying on the 29th of August, at four months and twelve days old; and laid for the first four days, *two eggs a day!* The others began to lay at four months and fifteen days old, *and have laid every day since.* Though from his limited experience, he does not feel prepared to give a decided opinion concerning the character of the Shanghaes, as layers, from what he has seen, he feels confident that they are much superior to the native breeds. As an example, he mentions a pair of his Shanghae pullets, of last year, which commenced laying October 14, 1850, and continued to the middle of June of 1851,

with an interruption of only ten days in January. Mr. Wilson thinks the Shanghaes possess another advantage over the natives, because the chickens are more easily raised. This he attributes chiefly to the fact, that they do not get in full feather until they are over five months old, and hence, as he infers, the substance which in others is developed in feathers, with them is incorporated in bone and muscle. He says he has raised over seventy chickens this season, and lost none by disease. The Shanghae, he says, is *a home fowl*, having no disposition to roam, and is little inclined to do mischief in the garden. They will weigh as much at five months old as the common kind, at full growth. He thinks the Dorkings are fully entitled to the high reputation they have received. He had on the 14th of February last, fourteen hens and two cocks, of the common breed, and their product up to the present time, has been 1391 eggs, besides about eighty chickens.

Mr. Eden says he commenced the season with thirteen hens, two pullets, and one cock. They commenced laying on the 1st of March, and between that and the present time, they laid 944 eggs. The breed is not mentioned. He shut them up six weeks to keep them from the garden, during which time they laid but few eggs; but he does not describe their mode of treatment.

Mr. Temple says his Plymouth Rock roosters are six months old, and the largest weigh six and three quarters pounds. The pullets are five and a half months old, and the largest weighs four and a half pounds. They are very hardy. Of his four early broods, not one died of disease. They are also very quiet, never attempting to fly over a fence three and a half feet high. Their flesh is fine flavored. They are good layers. The pair from which these chickens came, were bought Feb. 20th. The pullet was then eight months old. Up to September 1st, she laid eighty eggs, besides bringing out two broods of chickens. She is now in the midst of her moult, but lays, on an average, two eggs a week. The eggs are of large size and excellent quality.

Among the causes of ill success attending efforts to render the raising of poultry of any kind profitable, may be mentioned

the practice of allowing them to roam at large. In this way—to say nothing of the mischief which they do in gardens and fields—a large proportion of their eggs are lost, and to a considerable extent, they become victims to birds and beasts of prey. Another cause of failure is found in the very common neglect of protection from cold, and of suitable feeding, and other necessary attentions, in the winter months. In consequence of this neglect, hens are valueless during cold weather, because, under such circumstances they lay no eggs; and poultry, of every description, thus treated, come out in the spring, destitute of that thriftiness and energy, which are essential to the full development of their capabilities of growth and production. Indeed, there is no description of stock which more certainly and manifestly depreciates under bad treatment, and which more handsomely reciprocates good usage.

Almost every housekeeper, it is believed, may, by an economical and suitable arrangement, make the raising of the various kinds of poultry not only a source of great convenience in his family, but of profit, in proportion to outlay, quite equal, to say the least, with that arising from any other branch of domestic culture, besides adding essentially to the enjoyments, which necessarily flow from the contemplation of the results of agreeable and successful labor.

A. W. THAYER, *Chairman.*

Bread, Butter and Cheese.

The ladies, who delight in "household duties," furnished your committee with a very abundant supply of bread, and quite a respectable lot of butter and cheese. All the specimens were in excellent *taste.* They were seventy-one in number; being six of cheese, fourteen of butter, and fifty-one of bread. Many specimens were unaccompanied with written statements of the process of making. It is supposed that the society's rules are well known in reference to premiums. The numerous articles which had no accompanying statements, in conformity to these rules, are therefore deemed evidence of the disposition of

many ladies to add to the excellence of the show, not intended for premium. Such disinterestedness is certain to be appreciated.

The bread, for which premiums were awarded, appears, from the written statements, to have been fermented with yeast. This is the tenor of the old way, and for anything the committee know to the contrary, yeast may be the best leaven. It is presumed that there may be improvements in this respect by every lady, who is

> "Happy in this, she is not so old
> But she may learn; happier than this,
> She is not *bred so dull* but she can learn."

Dr. Gregory, in his Outlines of Chemistry, says, that yeast causes a loss of one sixteenth part of the flour, that is, of one ounce in the pound. He proposes to avoid this loss by the use of carbonate of soda, which has proved satisfactory; equally good bread is obtained, and there is no loss. The committee suggest a trial of the proposed substitute.

In respect to butter and cheese, the question may be put to the farmers' wives and daughters, Will you make a great deal more of the same sort? Will you do yourselves and our good old Commonwealth the honor to cause it to be said that Massachusetts makes her own butter and cheese? Your grandmothers and great-grandmothers, in 1787, made enough and had some left for exportation. The home supply of breadstuffs in Massachusetts does not keep pace with the increase of her population. The production falls two millions of bushels below the whole amount required for consumption. Will the farmers' wives and daughters look to this? May not the western portion of the State, in which agriculture is the leading interest, greatly increase its production of breadstuffs? There is already cheap transportation for produce, by railroads, to the larger towns and cities. It will pay. Much has been done; more can be done by agricultural societies, agricultural periodicals and books. Scientific culture is growing in favor. It may accomplish the work of making Massachusetts independent of the farms and farmers of our sister States. Scientific culture will be found the most economical and the most profitable.

May it become general, through the determination of our farmers to establish and to patronize agricultural schools.

BUTTER.

Mrs. Simeon Clark, Amherst,	- -	$4 00
" E. S. Huntington, Hadley,	- -	3 00
" Parsons West, "	- -	2 00
" S. Johnson, "	- -	1 00

CHEESE.

William Tilton, Goshen,	- - -	4 00

J. W. BOYDEN, *Chairman.*

Mrs. Simeon Clark's Statement.

I herewith present for inspection a sample of butter from a dairy of six cows, the proceeds of yesterday's churning. The milk is strained into tin pans, where it stands in a cool place from thirty-six to forty-eight hours; it is then skimmed, the cream put in tin pails, and stirred occasionally. Churn twice a week. After the butter comes, the buttermilk is drawn off, and the churn partly filled with sweet milk, and the butter worked in the churn till most of the buttermilk is out. It is then salted with ground rock salt, about one ounce to the pound, and after standing a few hours is again thoroughly worked over and put in lumps for market, or future use.

Amherst, *Oct.* 8, 1851.

Mrs. E. S. Huntington's Statement.

The milk from which this lot of butter was made, was set in tin pans, and the cream raised without artificial heat. It was taken off after standing forty-eight hours, and put into a tin vessel and slightly stirred at each time more cream was added. The cream was churned at a temperature of fifty-nine degrees, by the thermometer, and worked upon a platform with a brake and paddle. It was salted at the rate of half an ounce to a pound of butter. It was twice worked, and partially salted at each time.

Hadley, *Oct.* 7, 1851.

Mrs. Elizabeth P. West's Statement.

The milk was drawn from the cows into pails kept clean and sweet; strained as soon as milked, into tin pans, kept clean and sweet by washing and scalding. The milk stands before it is skimmed from thirty-six to forty-eight hours, the time varying according to the weather; in warm weather standing the shorter time. The cream is churned twice a week; the butter taken from the churn and washed thoroughly in clean cold water, then salted to the taste, and the salt worked in thoroughly. It then stands from twelve to twenty-four hours, and is worked into lumps.

HADLEY, *Oct.* 7, 1851.

Mrs. S. Johnson's Statement.

Our process of making butter is this: strain the milk into pans and let it stand from 24 to 36 hours; then take off the cream, which is not allowed to stand more than three or four days before churning, which is usually performed in 15 or 20 minutes, in a common wood churn. The butter is then taken from the churn, the buttermilk worked out, then salted, and after standing a few hours it is again worked and done up for use. The only rule we have for salting is to suite the taste.

HADLEY, *Oct.*, 1851.

William Tilton's Statement.

Take the milk from the cow, and while the natural warmth remains, add the brine in which a small piece of rennet has been soaked. After stirring well let it stand about one hour. It may then be broken up with a paddle used for the purpose. When the whey begins to rise, dip it off into a strainer and drain it well. After which it may be put into a press to remain a short time. Then cut in small pieces. Add warm water of such a temperature that you can bear a hand in it with ease. It may remain in this state from ten to fifteen minutes, then drain it off and cool it to the warmth of the milk. Add salt at the rate of fifteen ounces for thirty pounds of cheese; stir it well, keep it in the press twenty-four hours, except the time which is spent in turning, which probably will

not be necessary more than two or three times. When taken out of the press, it is turned and buttered every day until cured.

Goshen, 1851.

Fruits and Vegetables.

While advancing years bring the fraternity of husbandmen, with their experience enlarged, and their means and processes improved to realize more and more nearly their ideal of a perfect horticulture, and a perfect agriculture, they must needs, in the same degree, bring increased perplexity to those whose duty it is, to discern the hair's breadth of difference between the choicest productions here brought in competition. By what infallible instinct are we to discover inequality, where sunshine, shower and science have daily descended with impartial copiousness, to warm, water, and enlighten the intelligent industry of all?

Instead of the slender collection of some seventy plates of fruits, all told, on the strength of which, some five years ago, the Northampton Horticultural Club ventured to challenge the attention of the county, that department this day enumerates six hundred and seventy parcels, every one more rich and luxuriant than the former, and all justifying a pretty large pretension on the part of the club, to take rank among the "progressive" institutions of these latter times.

It would afford us much satisfaction, did our limits permit, to enlarge upon the history and operations of this club, that its example might be known and followed by all men. Its influence upon fruit culture in this immediate neighborhood is scarcely to be calculated. Old soils that before the club broke ground, were here and there found too debilitated to germinate even a respectable weed, at once became endowed with a new spirit of vegetation, and from that time forth have given abundant earnest that they are equal to any effort at reproduction. Old trees too, that had long ceased to remember when they last blossomed, and whose haggard and withered trunks and limbs seemed to cry out for some such thing as an agricul-

tural poor-house, whither they might retire and die—have presented their fruits here to-day, as worthy of the highest honors of the parent society.

There are undoubtedly many of the club, who have been successful in infusing new life and vigor into old trees and old soils. One gentleman at least, who takes a premium for the six best varieties of apples, will scarcely deem the imagery which we have used, a libel on his own fruit yard, as it was five years ago. This, however, is but a solitary example. No man who rides three miles out and back, fails to see, as well by the way side as in the field, numerous specimens of these trees, the superannuated relics of a better day, which by two or three years' skilful fostering would, by their abundant fruitfulness, make glad the hearts and hearths of their owners. And your committee would conjure every man, who has a fruit tree on his soil, with a breath of life in it, but yielding no fruit, if when he rests from his labors he would hope to rest in peace, and not find himself thrust through and through by some down straggling root, seeking to avenge the barren trunk above it—that he minister to the wants of that tree, prune it above and below, regale its roots with new food, clothe it with new foliage, adorn it with new bloom, and then shall that man's slumber be peaceful, and his children shall make autumnal mention of him. That most of the contributions were from Northampton, makes it evident that no such club exists in the neighboring towns. We earnestly commend the cause in which this club is engaged, far and near, and wish it God speed, wherever there is a seed time and harvest.

In awarding the premiums on apples, the committee were a long time in doubt whether Dr. Walker, or Willard A. Arnold, should receive the first premium. It is quite possible that the imposing presence of Dr. Walker's pyramid of Rhode Island greenings—60 to the bushel—decided the question. Besides, as he had reinforced his fruits with a strong detachment of vegetables, he had undoubtedly determined beforehand to carry the day. We have derived from Dr. Walker, a little of the personal history of this apple, which is this.

It (the R. I. greening) was from a tree budded on a seedling,

and supposed to be only eight years from the seed. In the meantime, it was twice transplanted, and for two years was not well taken care of. Dr. W. referring to the well known fact, that the older varieties of the apple yield fruit earlier from buds or scions than the newer varieties, states that some of the finest specimens exhibited by him, were from scions three and four years old, on stocks from an inch and 1-2 to two inches in diameter when grafted upon.

As respects other fruit, he has this year gathered the finest plums from trees grafted on wild plum roots three years ago, and has pear seedlings four years old, 4 1-2 inches in circumference, which he has no doubt, if grafted, will yield fruit in three or four years. Dr. Walker has also gathered from a single scion three years old, one bushel and one peck of the red bell flower. Thus his testimony ought effectually to dissipate the impression that a life time is required to see the full maturity and productiveness of seedling trees.

The second premium is awarded, of course, to Willard A. Arnold of Northampton.

For the best collection of Garden Vegetables. First premium to Wells Lathrop, of South Hadley, who exhibited 23 varieties; second premium to Dr. Walker, 17 varieties; third premium to John W. Wilson, ten varieties.

The attention of the committee was early directed to three varieties of potato, imported in 1850, by John Eden, of Northampton, and kindly distributed by him for the purpose of testing their adaptation to American soil. These varieties are known as the Axbridge Kidney, the prolific, and the Scotch, and, as we understand from Mr. Eden, came to him through the generosity and devoted interest to the cause of agriculture, of the Earl Ducie.

Contributions of three varieties were made by Messrs. Wm. Clark, Jr., Dr. Lewis Hopkins, of Northampton, and T. P. Huntington, of Hadley, the latter of whom contributed also two additional varieties, and reports that of the three varieties first named, he raised thirty-seven bushels from six quarts of seed. Ahira Lyman of Northampton, also exhibited six out of twenty varieties grown by him the present season, and consid-

ering the staple character of this esculent, and the public as well as private interest that attaches to every development of new conditions of its growth and health, we do not feel that we violate the discretion vested in us, in recommending gratuities of $1 to each of the above-named contributors.

CHARLES DELANO, *Chairman.*

Domestic Manufactures.

This year of our Lord eighteen hundred and fifty-one will long be famous in the history of mechanic art. The artisan shall name it with honest pride, as the year of the great World's Fair, the high festival of skilful labor.

Your committee must be permitted, in this connection, to direct attention to the fact, that the plough of Prouty & Mears, No. 40, which bore off the palm in "*running alone,*" at the ploughing match conducted by this society, last year, has since gained the victory against the world, in the great trial which was arranged in connection with the World Exhibition. Partly for the sake of this flattering endorsement of your proceedings, and partly for more general reasons, we have alluded to the most distinguished event in the records of industry.

It was a happy thought which led to the union of agriculture and the mechanic arts, in these annual celebrations. "The plough, the loom and the anvil" belong together; each is dependent upon the other, and society is most favorably constituted for progress, where the interests which these three words represent are duly fostered. The farmer looks to the mechanic for a convenient house and barn, for the skilfully devised plough, for tools which shall enable him to speed without slighting his work, for the strong wagon which bears his harvest homeward, six days, and for the graceful vehicle which conveys the household to church on the first day. The mechanic must have good corn and good beef, or his sinewy arm grows weak, and both farmer and mechanic, directly or indirectly, are greatly benefited by the ingenious labor-saving contrivances

which mark our day. It is greatly for the interest of these three classes that they should be established in convenient proximity, and that a familiar intercourse should be maintained between them. The intermingling of different kinds of population is one of the most powerful civilizing agents. It nourishes a genuine *esprit du corps*, whilst at the same time it discourages a conceited clannishness. It is one of the many benefits which we are to realize from our great net work of railroads, from those fire-breathing and rough-mannered yet beneficent giants, whose pathway often lies through the quietest hamlets in the land. An agricultural population is likely to be somewhat scattered. They cannot generally, as in these favored river towns, group their houses upon the fair plain or on the sides of the hills, that form as it were the frame of their great meadow landscape; each household must bide upon its own domain, and by its own stuff, relying very much upon its own resources for society. In such circumstances, the currents of life will flow on too sluggishly, and dullness will creep over the faculties of the mind, if not of the body. We occasionally hear of a sleepy hollow, even in our day.

A manufacturing population, on the other hand, will be distinguished by singular activity of brain, excited by the frequent contact of minds; by that spirit of intellectual life which animates large masses, coming we know not whence, and the danger here is, that the artisan will be stimulated to a morbid activity, a feverish restlessness, which will lead to a sad waste of energy. The farmer is likely to be an ultra conservative, the artisan an ultra reformer. The one depends unwisely upon Providence, the other is ready to intermeddle with his conceited plans. Let the two classes act each upon the other and you produce a just equilibrium of forces. The dividing lines between the two populations must not be so deeply drawn, as to prevent a constant and easy intermingling, the daughter returning to her father's hill-side farm house, and the young man, amidst the various exciting occupations of artisan life, not allowing himself to forget or lose the true movement of the scythe and axe arm. Let the different classes of laborers come together as freely and frequently as may be, especially in our

working-day land, let them come for congratulation and enjoyment, yes "to have a good time," let them bring each the choicest results of his skill, and in a right brotherly and manly way, let them magnify their crafts together.

It is said that we need amusements:—now we may "get up" amusements which will amuse nobody. because they are not in accordance with the practical downright character of the people. Archery clubs and the like will never do in this country and time of Colt's revolvers. How much better than anything which we could painfully devise, are these almost spontaneous festivities of autumn, the occasions of so much pure and profitable pleasure, affording indispensable relaxation, stimulating the various classes of laborers to renewed efforts, and helping, which to our mind is more than all, to shed a brightness upon agricultural and mechanic industry, and impart to it an ideal beauty, and make it honorable, as in truth it should be, in the eyes of the world. These occasions should be made much of, until men shall realize how great a thing it is and how nearly allied to creative skill, the power to take the rough, hard materials, which nature has scattered profusely about us, and hew, shape, mould, forge and polish them, until they wear a beautiful form and are fit for the thousand uses of life. What an interval, to be filled up by human toil and skill, between the lump of ore in the bowels of the earth, and the fine spring which is the almost living principle of the watch. It is a long journey from the wool upon the sheep's back, to the silk-like cloth, the rich warm shawl, to which we will gladly allow the name of our good old Commonwealth. Honor be to the craftsmen from Tubal Cain to Paxton! Honor to the men whom the Scripture does not hesitate to style wise-hearted, treating the genius in them as a kind of inspiration, the gift of Providence rather than the result of human effort, as indeed is the truth, for men are born mechanics as they are born poets, and the highest and nicest skill can never be acquired, though it may be cultivated and increased very much when the germ is once there.

It is the grand object of these exhibitions to cherish that honorable pride, and that spirit of emulation, which add so

much value to our work. We desire to arouse a zeal which shall stimulate the artizan to produce something more than a mere marketable article, something which shall be at once genuine and beautiful, wrought out too as with the laborer's whole heart, finished "to the nail," substantial and graceful,—the real thing and no passable imitation of it. We need some offset to the fierce competitions of trade, the tendency of which is to reduce the real worth of manufactured articles, and sacrifice much to the mere outside gloss, whilst the essential elements are overlooked. There must be such occasions to arouse men to a sense of professional honor, and to suggest the question, "whether amongst the hazards of business life, it is not worth while to venture something for the sake of gaining a reputation as a thorough workman?" Is it not far better to pay a fair price for a genuine article, than to receive for a comparatively small sum what would be dear though it cost nothing? That would be the most generous and profitable competition, which should aim to add the utmost grace and beauty to common materials. Who does not know, yet how many do not realize, that a graceful chair or table of oak is infinitely to be desired, before a tasteless structure of mahogany or rose wood? Schools of design are greatly needed in our new land. We earnestly hope that the beginning of such institutions for men, and we are happy to add for women, which are now enjoyed, may be fostered to a strong and serviceable maturity. The common mechanic requires the instruction which is to be gained in such institutions; it is just what is needed to change our ugly houses of four stories or of one story, into graceful dwellings, and to shape the plainest cottage furniture into graceful outlines.

It is an interesting feature in these shows, that for the most part, articles of moderate cost and universal utility are brought under our notice. We are not called upon to admire, with misgivings, the exquisite workmanship of most costly and luxurious articles, which too often only help to cherish an insane taste for display, and must be out of the reach of all save the wealthiest. Not that elegant and costly articles are not to be made; on the contrary, there are those who are sent into the

world to produce them, and they answer important purposes; but except in a highly artificial state of society, where great inequalities of condition prevail, they must needs be rare, and ought, perhaps, in any case, to be rather the pride of the public, in halls of state, schools and churches, than the boast of individuals. It is a happy condition of things, let the *connoisseur* complain as he may, when the industry of a country can be profitably directed to the production of articles which may gain a place in the cottage as well as in the palace, and will help to make the life of the laborer comfortable and free. For this reason, we like to see substantial woolens rather than costly brocades; a plain strong chair rather than a curiously wrought lounge, too beautiful to remain uncovered except on great state occasions; a well shaped spade or axe or saw rather than an elegant and costly jewel. In our circumstances we are bound to strive after a beautiful simplicity, to set the seal of genius upon coarse and common materials, to make pine wood classic, and arrange linsey woolsey into graceful folds.

Articles of strictly domestic manufacture are of course becoming less numerous, as our manufacturing establishments increase. The fire-sides are gone, in these days of stoves, and the old fire-side occupations are gone with them. The work which is done after the household labors have been discharged in our farm houses, is performed under the direction of large establishments in town or country, and is too suggestive of masses and of competition to remind one of the spinning wheel and distaff. It is pleasant, however, to know that a portion of the work done in our busy time can be performed at home, to relieve the monotony and fill up the intervals of domestic life, and, at the same time, to do away with any necessity for entirely deserting the parental roof in search of a livelihood. It is vain to fight against Providence; it is wise to direct as we best can the great tide of civilization. Labor in cottages, labor by hand of all sorts, we can return to if we choose, but who will choose so to do? We are not insensible to the many evils which infest manufacturing neighborhoods, but exclusively farming regions have never so far raised themselves above our common humanity as to be faultless, free from social

vice, and we must infuse such wiser and better life as we have into the civilization that must be, and wait patiently until it comes of age, and can prove that goodness and beauty were not exhausted by the world of our fathers, but can be realized even within the precincts of the huge factory, and within sound of the heavy bell.

It is hardly necessary to commend the subject of domestic manufactures to the residents of Old Hampshire. They were by no means the last to occupy the new ground of skilful industry, which has been opened in these modern times. Though they have been outstripped of late in the magnificence of great establishments, the cities of mills that have risen like magic upon the shores of the New England rivers, yet the woollens, cutlery and paper, and silk, buttons and brooms of Hampshire, have long been and still are established favorites in the great markets; and we can show an increase in the number and extent of manufacturing establishments. We wish that we could say as much of the manufactured articles on exhibition at our Fairs.

RUFUS ELLIS, *Chairman.*

D. Stebbins's Statement.

I present for the examination of those interested in the silk culture, fifty samples of silk made in Persia, with the several prices, for the Russian market, affixed on cards. Also a card containing American and foreign reeled silk, floss, and cocoons; also an impression of Canton foliage leaf, 9 by 7 inches, grown the present year at St. Louis, Mo., the product of stock sent there from Northampton, to commence a mulberry plantation. Another large shipment of trees and seed for several acres, was made the 4th inst., in the hope that this may form a nucleus to overspread the country with something more useful than California dust. Our soil and climate are propitious to the growth of the mulberry; our industrial habits and mechanical tact are adapted to make this country the emporium of silk culture.

The object of mulberry plantations at St. Louis, is not only for feeding silk worms and reeling silk for market, but to use the annual stalks, after feeding, to make bark silk, a sample of

which, in the shape of a child's apron, is exhibited with the raw material from Sumatra. The stripes are of different colors, showing the adaptation of bark silk to take any color. The Pongee silk of our stores, is made of mulberry bark, and is not spun by the silk worm. The old fashioned bark silk handkerchiefs, are made of the fibres of mulberry bark, manufactured in the East Indies.

A pair of socks, spun from the threads of perforated cocoons, and knit the present year by Mrs. Sophia Wright, of this town, are among the silk articles presented at the exhibition.

Northampton, *Oct.* 8, 1851.

Reclaimed Meadows.

The premium of $10 was awarded to Samuel Powers, of Hadley.

Samuel Powers's Statement.

The swamp, which I have reclaimed and entered for premium, is situated at the foot of a hill on the road leading from Hadley to Amherst, and previous to my efforts at reclaiming, it was completely filled with water, flowing from springs, which were abundant along the base of the hill. Its soil is of that kind denominated peat, and is formed of the accumulation of vegetable matter during a long series of years, until it is now several feet in depth.

This mass of matter lies upon a subsoil, which is so very hard that a plough will make no impression upon it; therefore what manure is put upon it will endure a long time, as it cannot waste by percolation, or leaching, as it is sometimes called. It is also of itself a valuable fertilizer, and we yearly use large quantities of it upon lands of an opposite nature.

It was of the first importance that the land be cleared of water, and to accomplish this I ran a ditch fifty-five rods in length, and from two to three feet in depth, along the foot of the hill, in order to cut off the springs. As the land was more elevated in the centre, I found it necessary to surround about eight acres with a deep thorough ditch, thereby concentrating

the water which covered the lower parts and carrying it completely away. The land was then left to drain one year, after which the swampy part of it was sufficiently firm to support the weight of a heavy team, consisting of three yokes of oxen, a large plough and three men, who were able by much hard labor, to plough one acre in three days, or at about that rate. The work was thoroughly done and the sods turned completely upside down, to the depth of eighteen inches or more.

The following spring I worked a large cultivator, drawn by two pairs of oxen, upon the surface, and then used a fine sharp tooth harrow for breaking the lumps of earth; after which I planted it with potatoes. The crop was very abundant, and larger than any crop I had ever raised. The year after, I ploughed it with a pair of horses, and not wishing to disturb the old sod previously turned under, I did not suffer the plough to run so deep as before. After harrowing it and gathering up the stumps and rubbish that usually cover the surface of new land, it presented a smooth and beautiful appearance. The manure I applied was a compost of ashes, lime and plaster, the principal ingredient being ashes. Of this I put a single handful in each hill, and immediately planted Indian corn. The next year I planted broom corn and put five loads of fine manure in the hills. The yield was fully equal to that of the best and most valuable lands in this vicinity.

The receipts from the five acres, treated in this manner, for the first three years of their improvement, after making a liberal allowance for all expense of labor and manure, are $80, over and above the expenditures, reckoning the products at their market value.

Since that time, I have planted it with broom corn every year, using five or six loads of manure to the acre, and have never failed of realizing a handsome crop, with the exception of the past season, which is a remarkable one throughout this whole region, on account of the failure of this crop. The land is now entirely reclaimed from its original worthless condition, and is as valuable and productive as any we have.

I will now give an account of the other part of this piece, containing about three acres, and which was so elevated

above the surrounding swamp as to be perfectly dry of itself, although surrounded by water. Its soil was also of an entirely different nature from the rest of the meadow, being of a fine heavy loam, but from its nearness to the dead swamp water, was entirely without life, so that the crop of corn and potatoes, which were planted upon it, did not flourish much, although the land was manured well in the ordinary way. I therefore concluded that barnyard manure was not adapted to the nature of the soil, and so resolved to make some experiments upon it, in order to discover the mode of treatment which it required.

In the fall of 1849, I made a pile of about 100 loads of compost, by digging peat from the swamp, to which I added 100 lbs. of saltpetre, 30 bushels of ashes, and between 400 and 500 lbs. of plaster, and spread it evenly over the surface of the whole heap. The next spring I carted the compost upon the lot, and spread it over the whole field at the rate of 30 loads to the acre, the expense of the whole operation being from twenty-five to thirty cents per load. I then planted it to corn, and applied five loads of manure per acre in the hill, for the purpose of starting the crop. I soon found this way of treating the land to be eminently successful; for it enabled me to gather a harvest of forty bushels to the acre.

At the last hoeing, in July, I sowed the ground with clover, herds-grass and red-top seed, and the following year (1851) mowed a fine crop of the best quality of hay, and it now presents a favorable appearance for future productiveness. The great difficulty with this piece of land in years past has been, that it was so subject to be thrown up by the frost as to render it difficult for seeds to take root. But this seems to be obviated by a free use of compost, and by following this course I hope entirely to do it away.

Hadley, *Oct.* 20, 1851.

GRAIN CROPS.

There was awarded to Silas Robinson, of Worthington, for a wheat crop, a gratuity of, . . .	$5 00
George Dickinson, of Hadley, for rye crop, do., .	3 00
Christopher and Austin Wright, Northampton, oat, wheat and rye crops, ...	20 00

Silas Robinson's Statement.

I enter for premium a crop of spring wheat. The crop covered one and one quarter of an acre of land, which had been in grass several years and become sward-bound, and was managed as follows:—In the autumn of 1848, I turned over the sward and let it lie till the next spring, when I harrowed the surface thoroughly without disturbing the surface, and planted it without any manure, partly with Merino and partly with Carter potatoes, and gathered in the fall 125 bushels of the former, and 75 bushels of the latter. After digging the potatoes, I ploughed the land and let it lie till the next spring.

I then (1850) spread over the land 37 cart loads of coarse barn-yard manure and ploughed it in; put in the hills eleven loads of compost manure, and planted it with corn and beans, and in the autumn gathered 60 bushels of corn to the acre and seven bushels of beans. After harvest, I again ploughed the land.

The 30th of April last, I sowed the land with $1\frac{3}{4}$ bushels of clean Black Sea wheat to the acre, without any manure whatever. The seed was soaked in common brine and rolled in fine slacked lime. The crop was harvested August 23d, and threshed and measured $37\frac{3}{4}$ bushels.

I have been on this farm six years, and have raised wheat every year, and this is the smallest crop but one that I have gathered. I have been induced to offer this for a premium, in the hope of stimulating other farmers to cultivate the wheat crop, believing that it is for their interest to raise their bread, rather than pay others to do it for them. Several of my neighbors have for a number of years cultivated this crop with nearly the same success as myself.

WORTHINGTON, *Oct.* 13, 1851.

George Dickinson's Statement.

The field contains 4¾ acres, lying on the north side of the Great Meadow, so called, in Hadley, contiguous to the river. The last crop of rye previous to this, was taken from the land in 1848. The stubble was ploughed in during the fall. In the spring of 1849, it was manured with barnyard manure, at the rate of eight loads to the acre ; a part of it was ploughed in, a part cultivated and harrowed. It was planted to corn, broom corn and potatoes, yielding a fair crop of the two former, but the crop of Indian corn was light. In the spring of 1850, the stalks being burnt off, the land was ploughed from six to nine inches deep, and manured with stubble manure, spread and harrowed in, at the rate of thirteen loads to the acre, and planted with Indian corn. A part of the seed failed ; the crows and worms took their share, so that the field was very poorly stocked, yielding only about twenty-eight bushels to the acre. The ground was then ploughed from eight to ten inches deep, and sown with rye one bushel to the acre, September 21st. The crop was harvested last July, and yielded one hundred and thirty-five bushels, or thirty and six-sevenths bushels to the acre, at a cost of fifty-six cents the bushel, including half the cost of the manure applied the present year.

Hadley, *Nov.*, 1851.

Christopher and Austin Wright's Statement.

We offer for premium the following crops; first, a crop of oats raised on one acre and seventy-one rods of land. In the spring of 1849, this lot was turfed, ploughed and planted to broom corn ; used ashes and not any manure ; obtained from 800 to 900 pounds of brush to the acre. In the spring of 1850, ploughed the broom stalks under, with fifteen to eighteen loads of green manure, and planted to Indian corn and potatoes, and received a very good crop. Last spring ploughed, sowed and rolled the same to oats, sowing (April 12th) *three* bushels of oats to the acre. Obtained ninety-one bushels, or about sixty-three bushels per acre. The oats were cut July 29th ; straw rather green.

In the next place, we offer two acres and ten rods of rye and wheat, in equal proportions. This lot was precisely as the other in regard to turf. In 1849, planted to broom corn, and obtained 2188 pounds of brush upon the same. In 1850, ploughed under the broom stalks with green manure, about the same as above, and planted with corn, which was cut up 15th September following. September 20th, ploughed and sowed to wheat and rye, one and a half bushels of wheat being sowed to the acre, and one bushel and four quarts of rye to the acre. Cut the same from July 17th to 19th, it being very green. The berry was very soft. It laid out one week before being housed. Threshed it out by hand. The whole amount of wheat and rye was eighty-four and one-half bushels; forty-three and one-half bushels of wheat, and forty-one bushels of rye, measured running from the mill, to the half bushel. These lots of land lie in Northampton meadows, the one called the Wright lot, and the other the Pomeroy lot.

Northampton, *Nov.*, 1851.

Root Crops.

To William P. Dickinson was awarded the premium on carrots, $6.

William P. Dickinson's Statement.

The crop of carrots I offer for premium, was grown upon a quarter of an acre of ground, which is set to young fruit trees. It has been planted with potatoes for three years, and well manured. Last April, I spread on seven loads of manure, and ploughed it in, eight inches deep. About the middle of May, I ploughed the land into ridges and sowed upon the top of them. It was hoed three times, and harvested in November.

The whole amount was as follows:—

60 bushels carrots, (50 pounds each,) 30 cts., -	$18 00
One-third of the manure to next crop, - - -	2 33
	$20 33

Expense of cultivation :—

Manure and seed,	$7 50	
Ploughing and harrowing,	75	
Drilling and sowing,	1 00	
Hoeing and harvesting,	5 00	
	——	14 25
Profit,		$6 08

Owing to the fact of some potatoes growing in the rows, some of them were not fully stocked. I had ten bushels of potatoes on the same, which were worth $7 50.

Theophilus P. Huntington's Statement.

I offer for premium, a crop of flat English turnips, one hundred and eighty bushels of fifty-two pounds each, raised on less than sixty rods of land. After harvesting a crop of winter wheat, which yielded about twenty-five bushels per acre, I ploughed in, July 24th, fourteen horse-loads of compost manure ; on the 25th, harrowed in thirteen horse-loads more, sowed in drills twenty inches apart and rolled. As soon as the plants were large enough, they were thinned to stand one foot apart in the row.

They were hoed once more and left till harvest time. Then, with a sharp hoe, the tops were cut and afterwards they were dug and thrown together with the same implement. The expenses of cultivation, including seven dollars for manure, amounted to $14. One hundred and eighty bushels of turnips, at 12½ cents, $22 50.

We see by this account, that twenty-five bushels of wheat, and five hundred bushels of turnips may be produced from an acre of land in one season, worth one hundred dollars. If our brother farmers, who are now engaged in the culture of tobacco, could be induced to devote their rich land and manure to the raising of crops useful to man or beast, perhaps they would be as well prepared to account for the manner in which they had "dressed and kept" the little portion of earth entrusted to them, notwithstanding their purses should not be so well filled.

Hadley, *Dec. 26th*, 1851.

ORCHARDS.

There was awarded for apple orchards,

To John L. Morton, 2d premium, - - -	$6 00
" Daniel L. Smith, 3d " - - -	4 00
" Ephraim Montague, Belchertown, peach orchard,	3 00

John L. Morton's Statement.

The orchard presented by me for premium, was set out in October, 1849, on light sandy land, in a low state of cultivation. It had been tilled for a long time, and would perhaps have produced fifteen bushels of corn per acre, without manure.

In digging the holes for the trees, I took off the soil, and placed it one side by itself. Holes two feet in depth by three in breadth. Before setting the trees, I put into the holes green manure, the scrapings from under an old barn, and from a chip yard. On setting the trees, with my fingers I carefully placed the roots, and thoroughly covered them with the soil, (that had been laid aside,) until the tree was firmly set, when the subsoil was thrown upon the top. Of eighty trees set in this manner, not one failed, and many of them grew from three to four feet the next season.

I have since given them four light top dressings of compost, varying in quality. The first two years, the compost applied was from the hog yard, without being dug in and mixed with the soil. The last two years, I have been more particular in the selection as well as the application of the dressing. It consisted of green manure and chip manure, of equal parts, to which were added lime, ashes and plaster, and was carefully dug in. The trees have been pruned in June. In hoeing the crops, I have uniformly hoed the trees.

Daniel L. Smith's Statement.

In the spring of 1844, my father gave me about two and a half acres of land, with the understanding that I should prepare and set it out to apple trees. This land was then valued by him at ten dollars per acre, it having formerly been sowed to rye until it was worn out. I commenced by ploughing it very

deep. The first three years I planted it to corn and potatoes, putting on about twelve loads of manure each year.

In the fall of 1847 and spring of 1848, I set out my trees two rods apart each way, buying about one half from the nursery, and the other half digging up about the lots, and engrafting myself, at the ground. I tilled the ground for two years as before, and then seeded it down. The manure used about the trees was compost and wood ashes. I put a small quantity in the hole, at the time of setting.

For a wash, I used weak ley. My trees are not as uniform in size as they would have been, had they all been purchased at the nursery. The land is now worth two hundred dollars per acre. I set out peach trees between some of the apple trees. Last year I sold twenty dollars' worth of peaches from these trees, besides having a supply for my own use. The apple trees have just begun to bear. I have cut on this land two tons of hay per acre, for the two years past.

NORTHAMPTON, *Sept.* 19, 1851.

Ephraim Montague's Statement.

My orchard consists of about one hundred and twenty-five apple trees and nine hundred peach trees, the greater part of which have been set out since 1845. The land is naturally stony, had been cultivated several years, and being on a side-hill, and but poorly manured, is not very rich. In some places, the heavy rains have washed nearly all the soil from the solid rock, of which the hill is composed. Still, I think the soil and location are favorable for peach trees, as they show by their vigorous growth and their present healthy and thriving appearance, although they have had no manure but ashes, plaster and a little lime. The ground has been cultivated every year.

The apple trees are set two rods apart each way, and the peach trees between, leaving the rows one rod apart, and the trees half a rod apart in the row. I have occupied the ground between the rows as a nursery.

I wash my trees often, as recommended in Cole's Fruit Book, as I think it not only promotes the growth of the tree, but is

preventive of the ravages of the borer. I practise the "shortening in" system of pruning the peach tree, believing it to be by far the best method to promote the health and beauty of the tree, and also the size and quality of the fruit. Some of my "Early Crawford" peaches, that grew on trees thus trimmed, measured nine inches in circumference, and weighed seven ounces. Forty-five peaches filled a peck measure, well rounded, weighing twelve and three-fourths pounds, which is more than four and a half ounces each on an average.

I have another field that was set out in 1849, with three hundred and forty peach, and sixty apple trees. I planted potatoes between the rows the first year, and after hoeing once or twice the second year, I sowed buckwheat between the rows, and did not hoe them again, until after haying this year, and about one quarter of the field, I have not yet hoed, designing to leave it without cultivation, to ascertain what will be the effect upon the growth of the tree and produce of fruit. So far as my experience extends, I am decidedly in favor of thorough cultivation, judicious annual pruning and washing of the trees, together with a top-dressing of ashes, lime, &c., as indispensable pre-requisites to a vigorous and productive orchard. My principal varieties are the Early Crawford, Yellow Rareripe, and Royal George, which I consider the most profitable for market.

Belchertown, *Oct.* 6, 1851.

HAMPDEN COUNTY AGRICULTURAL SOCIETY.

In presenting the transactions of this society for the current year, its directors say,—Let our first expression be gratitude for the manifestations of mercy and kindness received from the benevolent Author of all good gifts, whose protecting care has preserved us as in the hollow of his hand, and has crowned our labors with uncommon rewards. We have literally "sat under our own vines and fruit trees, with none to molest or make us afraid." Truly may we say, our lines have fallen to us in pleasant places, and we have a goodly heritage; our garners are full, —our baskets with corn, and our measures with the oil of fat things. It is with such feelings that we would commence the record of our annual exhibition. This society has been organized seven years, and has never before furnished the members with a copy of its transactions, by which to form an estimate of its past progress, or compare the present with its future success. This consideration, with the fact, that many who feel a deep interest in the welfare of the society would like to refer to some particular circumstance which transpired at these interesting anniversaries, or would like to re-peruse the detail of events and circumstances which then and there took place, and which have heretofore reached them only through the medium of a newspaper column, which is soon lost and forgotten, has influenced the directors to furnish this brief abstract of the doings of the society for the present year. We shall not attempt to rekindle those feelings of enthusiasm, which animated every one who witnessed the deeply interesting circumstances of our exhibition, by presenting a full description of each article under its appropriate head, but shall let the awarding committees tell their own story.

It is said that we live in an age of improvement. And if we compare the implements of husbandry of the present day with those our fathers *labored* with; the products of the same fields

of those days with the present; or the comforts and conveniences of our buildings for man and beast, with those which once were, we may well say, it is the age of progress. But it is not our purpose to contrast our superior accommodations and facilities, or our greater comforts, with those who, with much patience and long endurance, prepared the path, that our feet might stand secure, but rather, that we may the more fully realize the important truth, that "where much is given, much will be required."

The deep interest which is manifesting itself in the various branches of agricultural pursuits in our Commonwealth, is already producing developments too important to be overlooked with indifference. The ungenial climate and the stubborn soil which characterize our New England farms, are the obstacles we have to encounter in the production of the finer fruits and richer grain of milder climes, and the virgin soil of more favored latitudes; and yet the unsubdued patience, and unyielding perseverance of our hardy sons of labor, seem to have almost overcome these difficulties, if we were permitted to form our opinion from the samples of each on exhibition, at our last show and fair. Sustained and encouraged in every attempt to elevate the character of the husbandman, to facilitate his labors, to increase his products and his profits, by the liberal endowments of a parental government, the farmers of Hampden will respond to their obligations, by their constant and unwavering efforts to cultivate and improve "the mind and the soil" of their favored home.

The show of this society was held at Springfield, on Wednesday and Thursday, the 1st and 2d days of October last. Never, on any previous occasion, was the county of Hampden better represented in men, women, animals, fruit and articles of domestic manufacture. The cattle show was opened at ten o'clock, A. M., on the first day; each grade under its respective banner, and so arranged that each viewing committee could readily find and carefully examine the class of animals assigned to it. The ploughing match came off at two o'clock, P. M., about half a mile from the village, and attracted a large assembly of witnesses.

On Thursday, the second day, the exhibition of horses occupied the time till nearly noon. There were eighty-two entries of horses, embracing ninety-five animals. The address was delivered by Professor J. P. Norton, of Yale College.

Fat Cattle.

There were six yoke of fat cattle presented, either of which would have added a special attraction to any exhibition, and few and far between are the opportunities presented, of seeing at any one view on our show ground, twelve head of cattle, carrying from twenty-two to twenty-five hundred pounds of flesh and fat each, especially at this season of the year. The valley of the Connecticut River, has long sustained the reputation of producing the choicest stall-fed beef which the fastidious caterers for our city markets could obtain, and it is a matter of gratulation that Hampden county has justly acquired the reputation of standing in the front rank, for producing some of the finest specimens on exhibition there; and we feel fully assured that the cattle exhibited here to-day, when fully prepared by their respective owners for the market, will sustain the reputation already acquired, and add a fresh laurel to the farmers of Hampden.

We award to

George Taylor, of Westfield,	1st	premium, of	$8	00
Charles Fowler, of "	2d	" -	7	00
Seth Bush, of "	3d	" -	6	00

The attention of the committee, (after finishing the duty assigned them,) was arrested by the appearance of five yoke of cattle, owned and exhibited by Charles and John Fowler, of Westfield, a portion of which had been entered for premium as cattle for slaughter, and the others as "for the stall." It was our unanimous opinion that they excelled any team we had ever seen as belonging to any one farm, and although not a part of our duty, we cannot hesitate to pay a just compliment to the spirit of enterprise and emulation which is manifested

by the farmers of Westfield, and confidently express the hope that the same spirit will continue to manifest itself in the heart and action of every member of this society.

CYRUS FRINK,
SYLVESTER TAYLOR, } *Committee.*

Working Oxen.

The committee on working oxen, six years old and upward, (Bildad B. Belcher, chairman,) say, fifteen yokes were entered for premium. The show of this class of cattle was very good, though, in the opinion of the committee, hardly equaling, either in grade or numbers, that of some former years. They were all in excellent condition, and had the appearance of well-trained animals. We would ask if it would not be well to have this latter quality tested by actual experiment, at our shows of cattle? We have no desire to see them put to their utmost strength at a dead lift. We merely would have them draw an ordinary load, to show the manner of their training—whether they are perfectly obedient to the word of command, to haw and gee, to back and forward—that they are indeed *working* cattle, designed for labor rather than for slaughter. Would not such a trial add somewhat to the interest of the occasion? We think it would enable the committees on these useful and noble animals, to judge much better of the actual and full merits of each yoke.

The committee on working oxen five years old, (Samuel Warner, chairman,) say, the difficulties to be encountered in the examination of this class of stock, must be apparent to every one, and particularly so to those who are called to perform the duty. This class of stock generally constitutes the largest number under any grade, at our exhibitions, and amidst all the noise and bustle attendant upon such occasions, and the various opinions gratuitously expressed by others around them, the committee feel the embarrassment, in its full force; and yet these constitute but a portion which must be met. It is our duty to judge upon them as *working cattle.* And how are

we to know anything of their strength, their training, or their endurance under the yoke, or the amount of labor actually performed by them? Some evidence furnished to the committee by the respective owners of the cattle, on this point, would enable the committee to come to a more just conclusion than can be expected of them under the present arrangement.

The committee on oxen four years old, (Joel M. Lyman, chairman,) say, the whole number of entries under this grade was fourteen, and it was a matter of gratification to the committee, to notice the decided improvement in this class of stock. It has been truly said that the "ox knoweth his owner." And it is equally true, that no animal pays his owner better wages for the kind care and treatment he receives, than the ox. If we take into consideration his strong constitution, his teachable disposition, his mildness and submission, his early maturity for labor, the profits of his labor during his growth, the simplicity and cheapness of his harness, his value for food after having "acted well his part," are important considerations in agricultural economy, and we commend them renewedly to the mind and judgment of every practical farmer.

Milch Cows.

The subject presented for the consideration of this committee, is one of vast and increasing importance to the agriculturists of Hampden county; and we could wish it had fallen to abler hands to discuss its merits, and present the subject in its true light before the members of this association.

Although we cannot compete successfully with our neighbors of the vast *west*, in the raising of grain, to any great extent; we may, with our increasing *population*, and numerous *villages*, rely upon the productions of the cow, and find a ready market for those articles which are more difficult to transport.

These facts, we doubt not, are understood by most farmers, and hence the great increase in the number of cows within the limits of this society. But, it is evident there are other *facts*,

which although known are not applied and brought into practice to such an extent as the importance of the subject demands. We refer to the difference in value between a good cow and an ordinary one, and the importance of breeding from stock possessing high milking qualities; for it will not be doubted that while a good cow may have a bad calf, a poor cow is much *more likely* to have one. We will not attempt to prescribe rules, or define marks for the *breeding* and *selection* of cows; but venture the assertion that no individual who has observed *closely*, and has bred and selected with reference to *good qualities*, has failed to find his reward in the increased productiveness of the animals so bred and selected.

Neither do we attempt to give the comparative value of a good cow, and an ordinary one. But usually the difference in *value* is far more than the difference in *price.*

The cows entered for premium at this time, are Durham, Ayrshire, and Native; or a mixture, in different proportions, of the above-mentioned breeds.

The whole number of entries is fourteen. We have awarded the first premium on cows five years old and upwards, to John Chase, of Chicopee, for a Durham cow nine years old. This cow calved in July last, and has given during the last ten days 44½ pounds of milk per day. Her keeping, *good pasturage.* It is also certified, that in 1850, during four months from the first of May, she yielded an average of 40 pounds per day.

To Amos Carleton, of Chicopee, 2d premium, of - $5 00
" James Chapin, of Springfield, 3d premium, of - 4 00
" James Bagg, of W. Springfield, 4th premium, of - 3 00
" W. W. Boyington, of Springfield, 5th premium, of 2 00

MILCH COWS UNDER FIVE YEARS.

To J. L. Briggs, of Springfield, 1st premium, of - 5 00
" James Chapin, of Springfield, 2d premium, of - 4 00
" M. W. Ham, of Springfield, 3d premium, of - 3 00
" Pliny Merrick, of Wilbraham, 4th premium, of - 2 00
" Carlos Allen, of Springfield, 5th premium, of - 1 00

P. STEDMAN, *Chairman.*

A. Carleton's Statement.

Cow entered, No. 5; breed, native; age, 9 years; time of calving, 30th of March, 1851; killed the calf at the age of 3 weeks and 4 days; veal carcass weighed 81½ pounds; during the suckling of the calf, we milked from the cow 5 quarts per day; milk marketed; amount of milk given during the month of June, 1322½ pounds, or 529.8 quarts; September, 828 pounds, or 332.4 quarts; being an average of 17½ quarts per day, or 44 pounds; the feed of the cow was pasturage; *extra feed*, one peck per day of wheat bran, with a slight mixture of oil cake, the whole weighing 5½ pounds to the peck.

This cow has given since her calving, exclusive of the feed of the calf, 5669¼ pounds, or 2266⅔ quarts of milk; which at 4 cents per quart, amounts to - - - $90 67

Add to this, veal and calf skin, - - - 5 50

$96 17

Deduct for keeping 26 weeks, at 7*s.* 6*d.* per week, 32 50

Net gain, - - - - - $63 67

September 26th and 27th, set 20 quarts of milk—churned the cream from the same, which made 2⅞ pounds of butter.

Chicopee Falls, *Sept.* 1, 1851.

Mr. Carleton furnished a minute statement of the daily products of his cow, for June and September, in quarts and pounds, sustaining fully the high character of his cow for milk and cream, and his own as an accurate observer; but the directors concluded that the aggregate would give to others the desired information.

James Chapin's Statement.

The cow I present for premium is ¾ native, ¼ Ayrshire, 5 years old; calved the 24th of May past—calf raised. Her milk from June first to thirtieth, averaged twenty quarts per day, weighing forty-two pounds. Milk marketed. I was prevented by sickness, from keeping a record for the month of September. Her feed was common pasturage.

The three years old heifer, which I likewise present for premium, had her first calf the second day of January last, which is being raised; her milk was daily measured and weighed through the month of February, and averaged thirteen quarts per day, weighing thirty-two lbs. Her feed was hay. From June 1st to 30th her milk averaged 15 quarts, weighing 32 lbs. per day—feed common pasturage—breed half blood Durham.

Springfield, *Sept.* 30, 1851.

M. W. Ham's Statement.

The cow which I exhibit is four years old, Native Breed; she calved the 10th day of last October; her keeping through the winter was hay and corn fodder, through the summer she has pastured with fifteen other cows, and has received no meal. During the months of June and July, she gave thirty-six pounds of milk per day, from which was made five pounds two ounces of butter per week, exclusive of three pints of milk reserved daily for family use.

Springfield, *Sept.* 30, 1851.

Breeding Mares and Colts.

The committee (L. D. Fowler, chairman,) say, "they think that among our stock breeders, there is no animal that makes a greater return of annual income than the breeding mare. The subject demands the consideration of every practical farmer, and the best evidence we can offer to sustain our opinion is the exhibition of colts, three, two and one year old. These were all fine animals, many were superior, and their owners will soon realize the truth of our observation in the value received.

Swine.

The committee (Samuel Beebe, chairman,) say, "The duties devolving upon them have been unusually severe, from the unprecedented number of entries and the aggregate of animals

exhibited. There were one hundred and thirteen animals presented, under four different grades, for examination and award; the task of making a just discrimination under the most favorable circumstances would be a difficult one, even to the most practised eye, and particularly so under the limited opportunities which the time allowed would admit of. Had there been a greater disparity, had they constituted the two extremes, of good and bad, our duties would have been light and easy. But when all are good, it is more difficult to discriminate, and decide which are *better* and which *best;* better were never (probably) exhibited at any county exhibition. And the committee feel sincere pleasure in testifying to the evidences of decided improvement in this department of the show.

Poultry.

There were upon the ground sixty-six coops or cages of fowls, besides a dozen or more not entered, in consequence of being brought in too late; containing in all, some five hundred splendid specimens of the feathered race; fully equal in point of quality and good breeding to any exhibition of fowls in New England.

In justice to the examining committee it should be stated, that the names of the contributors were not known at the time of making their awards. This fact was subsequently ascertained by reference to the book of entries.

No. 45.—Shanghaes, bantams, and cross breeds, owned by Charles Barrows, of Springfield, who gives the following statement:—"This bantam hen is 17 months old, weighing $1\frac{3}{4}$ lbs., has laid, within six months subsequent to January 25, 1851, 119 eggs, weighing 169 ounces, and has reared one brood of chickens since the expiration of six months; while a Shanghae hen weighing 5 lbs. 6 oz., twenty-eight months old, during the same time, laid only 69 eggs, weighing 155 ounces, being a difference in favor of the bantam of 14 ounces. I have produced a new variety by crossing the Dorking, Poland, and bantam breed."

Butter.

The essential qualities of good butter are firmness, dryness and sweetness. The first quality depends principally on dairy stock, the two last depend principally on management and skill in making.

Butter of the highest excellence has these three qualities *combined*, and is moreover qualified or seasoned with the right modicum of pure salt.

No butter can properly be called *good* which is not *sweet*, and this quality must be inherent. It cannot be attained by qualifying it with any foreign ingredient. All sweet butter, however, is not good; it must be *dry* or free from milk. Assuming that it is both sweet and dry, another quality is essential to the highest attainment in the art, viz. *firmness*, and while this quality is attributed principally to dairy stock, it depends much on the quality of their food, and is not a little affected by management in the dairy room.

The three qualities above mentioned attained and combined, the excellence of butter depends much upon the *seasoning*. True, butter must be seasoned with salt, but not with every kind of salt. It must be pure, and though *seasoned* with salt, the salt must be thoroughly incorporated with the butter.

Every other part of making butter may be committed to strange hands without undue hazard, but this is the sole prerogative of her who presides over the dairy room, and the highest exercise of the art of making good butter.

There were seventeen lots of butter on exhibition; fifteen were entered for premium.

RICHARD BAGG, Jr., *Chairman.*

Vegetables.

Never since the organization of the society has the county of Hampden been so well represented from the garden, either in the amount of vegetables, or the superior quality and beauty of those on exhibition as at the present show. The ready

market, and increasing demand, for all the products of the garden have presented sufficient inducements to many in our immediate vicinity to enlarge the area of their labors far beyond all former precedent. And this result has awakened a spirit of emulation among the leading proprietors, and aroused the consequent feeling of competition in the breast of every one, not to be excelled by any one. This laudable spirit of emulation was clearly manifested in the praiseworthy struggle for the highest premium offered by the society for "the best collection and greatest variety," some of them offering from thirty to forty different kinds, embracing almost everything in the form of vegetable, and with strict regard to their quality. The entries amounted to the aggregate of three hundred and four, and these contributions, when arranged as they were by the judicious committee appointed to that duty, made a display most honorable to the producers, and gratifying to the admiring crowd of visitors. So nearly balanced in all respects were the three most prominent entries, in number and quality, the committee could not determine which should be the victor; they therefore awarded to each an equal sum, being the full amount of the three first premiums. These were awarded to Aaron Bagg, of West Springfield; Sylvanus Pendleton, of Chicopee; L. P. Dickinson, of Springfield.

D. C. BREWER, *Chairman.*

Fruit.

Already worthless and indifferent kinds of the apple are giving place to choice and valuable varieties, and the cultivator is amply repaid for all his trouble and care, and obliged to acknowledge that the orchard yields a return equal to any other part of the farm.

Our climate and soil are suited to the cultivation of the pear, and every man who has a small patch of land about his house, by planting trees (upon the quince stock,) and with proper care and training, can supply his own table with the choicest of fruit.

The first of October is too late for us to expect the best specimens and the greatest variety of peaches, still we had before us some very creditable exhibitions of this fruit.

Aside from the season, we think this fruit the present year has not been as good as in former years. This is undoubtedly owing to the unhealthy state of the trees, and we hesitate not to say that nearly all the trees in this vicinity are thoroughly and permanently diseased, and nothing will save them. Every tree having small wiry shoots coming out upon the trunk and branches is affected with the yellows, and may be set down as beyond the reach of medicine, and ought at once to be exterminated from the garden.

By procuring trees from western New York, where this disease has not extended, and starting anew, we can hope for healthy trees and perfect fruit.

There were 208 entries of fruit—last year, 80.

RICHARD BLISS, *Chairman.*

Directors' Report.

The cultivated crops of the field, improvement of barren soils, reclaiming bog-meadow, and fruit orchards, are all made subject to the action of the directors. And, in presenting the statements made to us on these subjects, we feel a great degree of pleasure, and even pride ; for they establish beyond a doubt two important facts, the capabilities of our soil and of our cultivators.

The aggregate of our premium crops of wheat and corn, may undoubtedly be largely exceeded in more favored localities, but we fully believe that we are now only seeing "the beginning of the end" of these important products among our own farmers. The first emotion and feeling of the yankee mind is not to be beat—to establish the facts assumed by us in relation to our soil and our cultivators, we had prepared a table of comparison between our own and the products of the same grain from the largest producing states of the Union, but most fortunately for us, one more competent, and having access

to the official reports of the patent office, has furnished, through the columns of the New England Farmer, a table of the crops, prices, and cost of cultivation, the results of an average for ten years, from 1840 to 1850 inclusive, and from which we copy the following on the wheat crop:

Massachusetts, average 18 bushels per acre,		
$1 34 per bushel, - - -	$24 12	
Value of straw, - - -	5 00	
		$29 12
Cost of cultivation, interest on land included, -		18 00
		$11 12
New Hampshire, average 20 bushels per acre, $1 34 per bushel, - -	$26 80	
Value of straw, - - -	5 00	
		$31 80
Cost of cultivation, interest on land included, -		22 00
		$9 80
Vermont, average 20 bushels per acre,		
$1 34 per bushel, - - -	$26 80	
Value of straw, - - -	4 00	
		$30 80
Cost of cultivation, interest on land included, -		20 00
		$10 80
Ohio, average 20 bushels per acre, 78 cents per bushel, - - - -	$15 60	
Value of straw, - - -	3 00	
		$18 60
Cost of cultivation, interest on land included, -		8 00
		$10 60
Indiana, average 20 bushels per acre, 75 cents per bushel, - - -	$15 00	
Value of straw, - . -	1 00	
		$16 00
Cost of cultivation, interest on land included, .		8 00
		$8 00
Illinois gives precisely the same results as the above,		8 00

Horace Smith's Statement.

The crop of wheat which I offer for premium was raised on seven and a half acres of land, the soil an alluvial sandy loam; the land was well prepared and planted with corn in the spring of 1850, and harvested an excellent crop, which was cut up and carted from the ground by the middle of September. We then commenced for the present crop, by dragging the land, (to level the cornhills,) which prepared it for the plough, this immediately succeeded, and on the 25th of September, the seed was sowed at the rate of one bushel and a half per acre, which was harrowed in and the land rolled; in July, 1851, the wheat was harvested, has been threshed, cleaned, and sold for $1 10 per bushel.

The product was two hundred and thirty-six bushels, amounting to - -	$259 60	
Eight tons of straw, at $6 per ton, -	48 00	
		$307 60
Expenses for		
Dragging the land for plough, - -	$2 20	
Ploughing, - - - -	9 37	
Seed, 11¾ bushels, at $1 50 per bushel. -	16 87	
Sowing, harrowing and rolling, - -	4 00	
Harvesting, at $1 25 per acre, - -	9 37	
Threshing and cleaning, - - -	9 00	
Cartage to market, - - -	3 00	
Land rent, $10 per acre, - - -	75 00	
		128 81
Net gain, - - - - - -		$178 79

Being a clear profit of twenty-three dollars and eighty-three cents per acre.

Justus Bagg's Statement.

The crop of wheat which I offer for premium was raised on seven and a half acres of land, the soil an alluvial sandy loam, on which a crop of corn was raised the year previous, the products of which I am unable to state accurately at this time.

After harvesting the corn the land was ploughed, and eight or ten ordinary loads of manure (summer made, in the cattle yard,) and four hundred bushels of leached ashes were spread upon the furrows and harrowed well; twelve bushels of seed was sown and the land again harrowed; the wheat was harvested in July past, and when threshed and cleaned gave me two hundred and twenty-three bushels of beautiful grain. It was sold for one dollar ten cents per bushel,

Amounting to - - - -	$245 30	
Straw, - - - - -	45 00	
		$290 30
Expenses for		
Ploughing, - - - -	$9 37	
Ashes and manure, - - -	35 00	
Harrowing twice, - - - -	4 00	
Seed, - - - - -	18 00	
Harvesting, - - - -	9 37	
Threshing and cleaning, - - -	9 00	
Land rent, - - - -	75 00	
		159 74
Net gain, - - - - - -		$130 56

Walter Cooley's Statement.

I present you a statement of my wheat crop which was raised on one acre of land. The lot was in corn last year, for which I received the first premium of the society. After the corn crop was harvested, the land was ploughed, and the seed sowed the first week in October, two bushels to the acre and harrowed in. The crop was harvested in July, and the product was thirty-eight bushels, weighing sixty-three pounds per bushel. It sold for one dollar ten cents per bushel,

Amounting to - - - -	$41 80	
Two tons of straw, - - -	12 00	
		$53 80
Expenses for		
Ploughing, seed and harrowing, - -	$6 50	

Harvesting,	$3 00	
Threshing,	2 00	
Interest on land,	12 00	
		23 50
Net gain,		$30 30

John Stiles's Statement.

The wheat crop I offer for premium was grown on one acre of land; the product was thirty-seven and a half bushels, weighing sixty-three and a half pounds per bushel. The land was lightly manured a year ago last spring, and set with tobacco, which was a good crop; after the tobacco was taken off, the land was ploughed once and sowed with one bushel and a half of seed the twentieth of September; the seed was first soaked in brine, then rolled in lime. The land is rather heavy, sandy loam.

Value of crop, at one dollar twenty-five cents per bushel,	$46 87½	
Straw,	10 00	
		$56 87½
Expenses for		
Ploughing,	$1 25	
Seed, salt and lime,	2 75	
Sowing and harrowing,	1 00	
Harvesting,	3 00	
Threshing,	3 00	
		$11 00
Net gain,		$45 87½

R. H. Barlow's Statement.

The crop of wheat which I present to the society for premium was raised on one acre and fifty rods of ground; the soil, a gravel, on which a crop of corn was grown in 1850. The amount of manure for the corn crop was 20 common cart-loads of barn-yard manure to the acre, made from turf, muck, straw, leaves, &c. The crop of corn I did not measure exactly, but called it about sixty bushels to the acre. After har-

vesting the corn, the land was ploughed once, and the seed harrowed in the first week in October. Land valued at one hundred dollars per acre. Raised forty-four bushels of wheat.

Value of crop, at one dollar twenty-five cents per bushel, - - -	$55 00	
Straw, - - - - -	5 00	
		$60 00
Expenses for		
Ploughing, - - - -	$2 00	
Three bushels of seed, - - -	4 50	
Harrowing, - - - -	1 00	
Ten bushels of ashes, - - -	1 50	
Harvesting, threshing and cleaning, -	7 00	
Interest on land, - - - -	8 00	
		24 00
Net gain, - - - - - -		$36 00

Silas Root's Statement.

The crop of wheat I offer for your consideration, was grown on three acres of land, all in the same field, soil heavy loam; each acre differently cultivated. The first acre had lain in grass for six years, with a top-dressing of manure once in two years. I cut a crop of grass the first week in July, 1850; a second crop, the first of September. As soon as the hay was taken off I ploughed the ground; middle of September, I harrowed it fine and mellow, then spread on six loads of compost manure, sowed on six bushels of air-slacked lime, two bushels of seed, and harrowed them all in together; in April sowed on two bushels of plaster Paris; from this acre I harvested thirty-six shocks of wheat. The second acre was land, where I raised a crop of wheat the year previous, managed the same as the above; I ploughed the land about the first of September, the young clover was then as high as the stubble, they both being as much as I could well plough under; soon after, harrowed the ground well; middle of September sowed one bushel and a half of seed, harrowed it in; sowed on two bushels of plaster, in the spring; from this acre I harvested twenty-six shocks of wheat. The third acre was grown after a corn crop;

the ground previous to the corn crop had lain to grass some years without manure; before ploughing for corn, I spread on twenty loads of manure to the acre, cut the corn last of September, ploughed the ground as soon as the corn was off, let it lie two or three days, then sowed on two bushels of seed, ten bushels of ashes, and harrowed them in. From this acre I harvested twenty-nine shocks of wheat, making in all ninety-one shocks, from which I threshed ninety-one and three-fourths bushels of good wheat, averaging a little more than a bushel to the shock, weighing sixty pounds to the bushel. My uniform practice is to soak the seed twelve hours in brine, then roll it in lime or ashes; when I have done this, I have never had any smut.

Value of crop, at one dollar twenty-five cents per bushel, - - -	$114 58	
Five tons straw, at 4 50 per ton, -	22 50	
		$137 08
Expenses for		
First acre, labor, manure, seed, &c., -	$20 75	
Second " " seed, &c., - -	10 50	
Third " " ashes, seed, &c., -	11 25	
		42 50
Net gain, - - -		$94 58

In presenting this statement of my wheat crop, I deem it proper to make some remarks in relation to the raising of this very important crop. Having been in the practice of raising more or less for twenty years, not having failed, I believe, in one instance during this time of sowing at least a small piece of wheat, and having during that time made several experiments, and noted down the results with careful observation, and well-ascertained facts, I find that there has not been an entire failure more than twice during that time, and not more than five or six times has the crop been less than a rye crop would have been; but in most instances, the crop has been much larger, and sometimes nearly double. In making a careful estimate of the value of the two crops for the last twenty years, I find the value of the wheat crop to be at least one-third more than the

value of a rye crop would have been on the same ground. With these facts before me, I believe that wheat can be raised by many farmers at a good profit, at least enough to supply their own families, and thereby lessen our dependence on other states, and save an amount of capital to be employed for other purposes.

The directors award to

John Stiles, of Westfield,	1st premium, of	$5 00
Walter Cooley, of West Springfield,	2d " -	3 00

Rye Crop.

J. M. Merrick's Statement.

The land on which my crop of rye was grown, consists of three acres and a half; mostly a light sandy loam, a part of it gravelly. This land was manured in the spring of 1849, with about seven cords of stable manure to the acre, spread on top of the sward, and turned under about the middle of May, six inches deep. The sward was quite heavy. A crop of corn was taken off that season, and in November the land was sowed with rye. Soon after harvest in 1850, the stubble was turned in; and the last days of August and first of September, the land again ploughed, and sowed with rye at the rate of twenty-six quarts per acre.

I have this season harvested from this field, ninety-five bushels of rye, averaging twenty-seven and one-seventh bushels per acre. Value of crop, at seventy-five cents per bushel, - - -	$71 25	
Five tons of straw, - - -	20 00	
		$91 25
Expenses for rent of land, - -	17 50	
Turning in stubble, - - -	3 50	
2d ploughing, $3 50; harrowing in seed, $2,	5 50	
2½ bushels seed, (white rye,) - -	1 87	
Harvesting, threshing, - - -	12 65	
		41 02
Net gain, - - - -		$50 23

J. Hooker's Statement.

The lot on which my rye crop was raised, contained an acre and a quarter of land. In 1849 a crop of rye and turnips were raised on it, and in 1850 a crop of corn. The rye was sown in the fall of 1850, (in the last days of September,) immediately after taking off the corn crop; it was previously manured for the corn—about five cords to the acre, but none was applied when the rye was sown. The ground was ploughed, and then the seed sown upon the furrow, and was harrowed over once. The rye was gathered the last of July, and yielded thirty-nine bushels by measurement. The quantity of seed sown was rather more than farmers usually sow, being two bushels and a peck to the whole piece.

Value of crop, at 80 cents per bushel, -	$31 20	
" straw, - - -	10 00	
		$41 20
Expenses for		
Seed, - - - - -	$1 80	
Labor, ploughing, harrowing and sowing,	3 00	
Harvesting, - - - -	4 00	
Threshing, - - - -	3 00	
¼ of the manure, (applied to the previous crop,)	6 25	
½ the interest of the value of the land, (there being a turnip crop same year,) -	7 50	
		25 55
Net gain, - - -		$15 65

Francis Brewer's Statement.

I present a statement of my crop of rye raised on one acre of pine-plain land, being a portion of a lot purchased by me in 1841; it has never received but one load of manure since I have owned it, and that was applied in corn-hills, and was a total failure, excepting a large growth of cornstalks. In 1847, I sowed oats and clover upon it; the oats were a failure, the clover was a partial catch, but mowed in 1848; in 1849, the sorrel had, to use a court phrase—"expunged" the clover, and

the crop was mowed and carted into the highway, to prevent its further seeding; in October, 1849, the land was ploughed, in the spring of 1850 harrowed and planted with potatoes; the product a medium crop of excellent potatoes. After harvesting the potatoes early in September, the land was ploughed, and the furrows levelled with one horse and harrow; the 25th, one bushel of Italian rye was sown, and the land cross-harrowed. In July last the rye was cut with the sickle while the grain was quite soft, and lay spread some three or four days before binding, housed in good order—has been threshed, cleaned, and measured twenty-three bushels and a half.

Value of crop, at 75 cents per bushel, -	$17 62	
1 ton of straw, - - - -	5 00	
		$22 62
Expenses for		
Ploughing, - - - -	$2 00	
Harrowing, - - - -	1 00	
Seed, - - - - -	75	
Harvesting, - - - -	2 25	
Threshing and cleaning, - - -	2 00	
Interest on land, - - -	54	
		8 54
Net gain, - - - -		$14 08

This crop pays the cost of the land, the expenses of producing it, and the interest, and leaves me five dollars and eight cents.

The directors award to

J. M. Merrick, of Wilbraham, 1st premium, of -	$4 00
Josiah Hooker, of Springfield, 2d " -	2 00

Oat Crop.

Horace Clark's Statement.

I offer for premium my crop of oats which was raised on one acre of land, valued at fifty dollars. One year ago last spring,

I ploughed in about five cords of barn yard manure, valued at two dollars per cord, and planted with corn. Last April I ploughed once, and sowed on three bushels of oats and harrowed them in; I have this day measured them, and there is eighty-five bushels and a half, weighing 2,821 pounds.

Value of crop, at 45 cents per bushel, -	$38 47	
Straw, - - - - -	5 00	
		$43 47
Expenses for		
Ploughing, - - - -	$1 00	
Sowing and harrowing, - - -	75	
Three bushels of seed, - - -	1 50	
Harvesting, - - - -	2 50	
Threshing and cleaning, - - -	4 25	
Land rent, - - - -	3 00	
		13 00
Net gain, - - - -		$30 47

J. H. Demond's Statement.

The crop of oats which I present for premium was the product of one acre and a half of land, which, in 1850, was planted with broom-corn; the land was prepared for this crop by ploughing under twenty loads of compost manure, about twenty-five bushels per load, the soil a fine, mellow, sandy loam—was then planted. The result of this crop was eight hundred pounds of broom-brush and eighty bushels of seed, per acre. Early in the spring of 1851, the stalks were cut and burned on the ground, the land was then ploughed, and the oats sowed upon the furrows, then harrowed and rolled. The product was eighty-two bushels, weighing thirty-four pounds per bushel, being fifty-five bushels per acre.

Value of crop, at forty-five cents per bushel,	$36 90	
Two tons of straw, - - - -	12 00	
		$48 90
Expenses for		
Ploughing, - - - - - -	$2 25	

Seed, - - - - - - - -	$1 68	
Harrowing, and rolling, - - - -	1 50	
Harvesting and threshing, - - -	6 85	
Land rent, - - - - - - -	10 00	
		$22 28
Net gain, - - - -		$26 62

The directors award to
Horace Clark, of Wilbraham, 1st premium, of - $4 00
J. H. Demond, of Springfield, 2d " - - 2 00

Corn Crop.

Before presenting the statements on corn, we offer some further quotations from the authority we have cited on wheat, as the two crops constitute the base of his comparisons; the same form was adopted in relation to this grain, but we will abridge, and give only his average crops and profits thus:

Massachusetts, av. products per acre,				40	bu.;	av. profits	$19 00
N. Hampshire,	"	"	"	40	"	"	18 00
Vermont,	"	"	"	40	"	"	17 20
Ohio,	"	"	"	50	"	"	10 00
Indiana and Illinois, same results				60	"	"	9 40

Horace Smith's Statement.

The crop of corn which I offer for premium was raised on five acres of land, alluvial sandy loam, which has been in grass and mowed for the last four years. Early in the spring of 1851, this lot was ploughed, turning the furrows from six to seven inches deep; it was then well harrowed, and about six cords of stable manure to the acre was spread upon the surface, and covered with the plough, throwing it into ridges or rows to plant upon without disturbing the reversed turf; the planting was done athwart these ridges—the corn received three hoeings, which was all the labor bestowed upon its growth. In September, it was cut up and stacked in the field, since

which it has been harvested, and the yield was three hundred and fifty bushels, or seventy bushels per acre.

At seventy-five cents per bushel, amounts to	$262 50	
Twelve tons of fodder, - - -	72 00	
		$334 50
Expenses for		
Ploughing, - - - -	$7 50	
Harrowing, - - - -	2 00	
Thirty cords of manure, - - -	75 00	
Carting and spreading, - - -	15 00	
Covering with light plough, - -	2 50	
Planting and hoeing, - - -	18 50	
Cutting and stacking, - - -	4 00	
Harvesting, - - - -	12 00	
Threshing and marketing, - -	7 00	
Land rent, - - - -	60 00	
		203 50
Net gain, - - - -		$131 00

My practice, for twenty years past, in cultivating my meadow land, has been a five years rotation, as follows: first corn, second wheat, and three years in grass, and my experience and success still warrant a continuance in this system.

Walter Cooley's Statement.

The corn crop which I offer for premium was raised on one acre of land which had been in grass for the past five years, and been mowed annually without receiving any manure; last spring five cords of stable manure was carted and spread upon the turf and turned under by the plough; the land was then harrowed and planted in hills three feet apart each way; the cultivator was used at the first and second hoeing and a light plough for the third. The corn was ashed in the hill. I have harvested one hundred and sixty-five bushels of ears, equal to eighty-two and a half bushels shelled.

Value of crop, at 75 cents per bushel,	$61 87

Two bushels of soft corn, - -	$0 50	
Two tons fodder, - - -	12 00	
		$74 37
Expenses for		
Ploughing and harrowing, - -	$3 25	
Manure, seed, and planting, - -	17 50	
Hoeing, - - - - -	3 00	
Harvesting and husking, - -	7 00	
Interest on land, - - -	10 00	
		40 75
Net gain, - - - -		$33 62

J. Hooker's Statement.

My corn crop was raised on a lot of three acres, being a portion of the land on which my apple-orchard is growing. In 1849, crops of corn, carrots, and turnips were raised on the ground, and in 1850, corn and barley. The ground was manured last spring by the application of about five cords of compost manure to the acre, and it was spread over the ground and ploughed in. The seed was a small kind of corn (of eight rows) from Worcester county, called Canada corn—known here also as the Demond corn. It was planted with a seed-sower in drills three and a half feet one way, and two feet the other—it was twice cultivated and hoed—it was not hilled at all—it was cut and stooked up in the field in September, about the middle of the month; and was all gathered into the barn in the course of the month of October. The yield was two hundred and twenty-five bushels, being seventy-five bushels to the acre.

Value of crop, at eighty cents per bushel,	$180 00	
Corn-stalk fodder, - - -	27 00	
One fourth manure back, - -	15 00	
		$222 00
Expense for		
Fifteen cords of manure, and labor, -	$60 00	
Seed—three pecks, - - -	75	
Ploughing, planting with seed-sower, -	6 50	
Hoeing twice, - - - -	6 00	

Cultivating, harvesting, - - -	$9 00	
Cartage and husking, - - -	10 00	
Interest on land, (deducting one per cent. on account of orchard,) - - -	30 00	
		$122 25
Net gain, - - - -		$99 75

From these statements if we deduct the actual cost of cultivation as furnished, and establish the value of the grain at 75 cents per bushel, and the stover at nine dollars per acre, we have the following results:

Mr. Cooley's total val. was	$70	50	pr ac.;	actual profits	$29	75
" Hooker's " " "	65	25	"	"	"	22	50
" Smith's " " "	61	50	"	"	"	20	80

These results furnish a most interesting subject for a few more figures, but we hope every individual will find sufficient interest in the subject to make his own. We award to

Walter Cooley, of West Springfield,	1st	premium, of	$5 00
Josiah Hooker, of Springfield,	2d	" "	3 00

Carrot Crop.

Samuel Warner's Statement.

My crop of carrots was raised on a quarter of an acre of land, on which potatoes were raised the previous year. My land was prepared by spreading four cart loads of stable or yard manure, and ploughing twice; my seed did not come up well, of course there were some vacant places, but contrary to my expectation, I harvested this fall two hundred and thirty-seven bushels of carrots, some of them measuring two and a half feet in length and weighing four pounds.

Value of crop, at thirty-three cents per bushel,		$78 21
Expenses for		
Use of land, - - - -	$3 00	
Ploughing and harrowing, - -	1 00	

Four loads of manure, - - -	$4 00	
Sowing, - - - -	2 00	
Hoeing, - - - - -	18 00	
Harvesting, - - - -	3 00	
		$31 00
Net gain, - - - -		$47 21

M. Hitchcock's Statement.

The crop of carrots which I present to notice was grown on forty-eight rods of light sandy land, and from which a crop of carrots has been taken for the two preceding years; in the spring of 1851, two cords of stable manure were spread and the land ploughed, being fine and mellow, the furrows were levelled, and prepared for the seed with a hand-rake, the seed was sown in drills twenty inches apart—they were hoed three times, and kept free from weeds. I have gathered two hundred and forty bushels, weighing forty-six pounds per bushel, and have sold and used twenty-five bushels, which were pulled in thinning the crop, and are not included in this estimate.

Value of crop, at thirty-three cents per bushel,		$79 20
Expenses for		
Manure, - - - - -	$6 00	
Ploughing, - - - -	1 00	
Raking and sowing, - - -	1 25	
Hoeing, - - - - -	9 00	
Harvesting and marketing, - -	8 00	
Interest on land, - - - -	1 50	
		26 75
Net gain, - - - -		$52 45

Jonathan Carlisle's Statement.

I send you a statement of a crop of carrots raised by me the present year on one acre of light sandy loam; this acre of land was in part planted with potatoes and melons, and the remainder was sowed with millet the last year. The melons were manured in the hill; no other manure was used on the land. The yield of potatoes was about fifty bushels; on the

remaining portion I spread twenty-five bushels of leached ashes and sowed the millet. Last spring I applied five cords and a half of compost manure, ploughed it under and harrowed it; just before sowing the seed the land was again ploughed and harrowed; the seed was sowed the third day of June; in October, they were harvested; the yield was five hundred and thirty-eight bushels of carrots, weighing forty-five pounds per bushel.

Value of crop, at twenty-five cents per bushel,		$134 50
Expenses for		
Ploughing twice,	$2 50	
Harrowing twice,	1 00	
Five and a half cords of manure,	23 00	
Seed and sowing,	2 50	
Hoeing,	45 00	
Harvesting,	10 50	
Use of land,	3 00	
		87 50
Net gain,		$47 00

The directors award to

Miner Hitchcock, of Chicopee, 1st premium, of $3 00

Samuel Warner, of Wilbraham, 2d " 2 00

Turnip Crop.

Miner Hitchcock's Statement.

The turnip crop which I offer for premium was raised on one fourth of an acre of light sandy land, which was last year planted with field beans. No manure was applied. In August of this year I drew one cord of fine manure and spread it evenly, and covered with the plough. The ground was levelled and made smooth with the hand-rake, the 9th day of August; the seed was sowed in drills twenty inches apart; when well up so as to discover the rows distinctly they were hoed and thinned suitably; two barrels of unleached ashes were then

strewed over the land, and no other labor was bestowed upon them until harvesting the crop.

The product was one hundred and sixty bushels of fine long turnips, which I have sold at twenty-five cents per bushel, amounting to - - - - $40 00

Expenses for		
Manure and ploughing, - - -	$3 75	
Hoeing and ashes, - - -	1 56	
Harvesting and rent, - - -	3 00	
		8 31
Net gain, - - -		$31 69

Samuel Warner's Statement.

My crop of turnips I raised on five or six acres of land, by scattering the seed thinly among the growing corn; immediately after hoeing the last time, I harvested from my corn-field four hundred and fifty bushels of nice turnips.

Value of crop, at fifteen cents per bushel,		$67 50
Expenses for		
Seed, ashes, and sowing, - -	$5 00	
Harvesting, - - - -	13 50	
		18 50
Net gain, - - -		$49 00

I consider what I left on the ground, to well pay for the use of the same.

Josiah Hooker's Statement.

My turnip crop was raised on the same lot of land with the rye, and was sowed in the last days of July, immediately after the rye was gathered. The seed was the long English turnip. The stubble was turned in with the plough, and the ground bushed down and the seed sowed in drills eighteen inches apart. No manure was applied—the yield was five hundred bushels. I consider this crop the most profitable that is raised on my farm.

Value of crop, - - - - $83 33

Expenses for		
Labor, ploughing, &c, - - -	$3 50	
Seed, - - - - -	1 00	
Harvesting, - - - -	10 00	
½ the interest on the value of the land, (there having been a previous crop of rye on it,) - - - - -	7 50	$22 00
Net gain, - - - -		$61 33

The directors award to

Miner Hitchcock, of Chicopee, 1st premium, of $2 00

Josiah Hooker, of Springfield, 2d " 1 00

Reclaimed Meadows.

Henry Ashley's Statement.

The piece of reclaimed swamp to which I call attention, contains three acres; it was originally covered with wood, brush and water. I first cleared the timber from the land—a ditch was dug around the foot of the hill about seventy rods, to drain it. I commenced digging stumps with three men and two yoke of cattle. In June, 1850, I burned over the ground and commenced ploughing with two yoke of cattle and two men, with a plough made expressly for the purpose; the same month sowed it to oats and stocked it down. In 1850, cut three tons of mowed oats to the acre, and two and a half tons to the acre, of grass. In 1851, a part of the three acres I sowed to oats, in June, and stocked it down. In September, I sowed a small piece to wheat. I have made an estimate of clearing, ditching, digging stumps, and ploughing at fifty dollars per acre.

We award to Mr. Ashley, rather for his unyielding perseverance and determination in conquering the obstacles to his future labor, than for the amount of improvement, the 2d premium, of $4.

Fruit Trees.

The deep interest manifested upon the subject of fruit and fruit orchards within the limits of our society is truly laudable, and sustains the pleasing anticipation that ere long our increasing wants will be supplied from our immediate orchards, with the choicest specimens of every desirable variety.

In examining the orchards presented by the several competitors, the directors can but express themselves highly pleased with the zeal and skill manifested in planting, nurturing, and training their trees. We feel assured that every member of our association would be amply compensated by visiting and examining these orchards and ascertaining the different modes of culture for themselves; we cannot refrain from calling particular attention to the method of resuscitation, practised by Mr. Hooker on his apple trees, when girdled by mice, for it may be the means of saving some valuable specimen for others.

We award the premiums as follows:

APPLE ORCHARDS.

To Josiah Hooker, of Springfield, 1st premium, of	$8 00
To Rufus Whittier, of Chicopee, 2d " -	6 00

PEAR TREES.

To D. C. Brewer, of Springfield, 1st premium of -	4 00
To Rufus Whittier, of Chicopee, 2d " -	2 00

PEACH TREES.

To D. C. Brewer, of Springfield, 1st premium of -	5 00
To Rufus Whittier, of Chicopee, 2d " -	3 00

Apple Orchard.

Josiah Hooker's Statement.

My apple orchard consists of one hundred and seventy-five trees, embracing most of the varieties of apples produced in

New England. The orchard was begun in 1845 by the setting out of twenty trees. Forty were added in 1846. The residue have been planted from time to time since 1846 up to the present year. They are set out in rows at a distance of forty feet each way.

The soil is sandy loam; and for the first three years after the orchard was begun, the lot was a mowing lot, and the trees did not thrive and grow so well as subsequently, when the land was turned into tillage, and more pains taken with them. The ground has been planted with corn and potatoes, and crops of carrots and turnips have also grown upon it, the quantity of manure applied, being that which is usual in raising such crops. Care has been taken to have the soil dug and loosened around the trees, and they have been thoroughly washed, from time to time, as they seemed to need it, with soft soap reduced, viz., about two fifths soap to three fifths of water. The trees are trimmed every year, usually in the spring, in such a manner as to have them open in the centre.

The most destructive enemies to the trees have been the mice that infest the field. With all the precautions that have been taken, in stamping down the snow around the trees, &c., in the winter, we have not been able entirely to protect them against their ravages. This year I have had a mound of compost manure placed around each tree, (being about half a cart load for each,) and covered with soil and made hard. This not only serves the purpose of protecting the trees against the mice, but keeps the roots of the trees warm, enriches the soil around them, and helps support the tree during the storms of winter. The manure will also be ready to be used on the ground at the opening of spring.

Year before last, five of my trees were girdled and apparently destroyed by the mice. But a remedy was applied which saved them. Twigs of the proper length were cut and being sharpened at each end were inserted above and below the gnawed part, and fastened by bandages and grafting wax, so as to form a communication for the sap. The twigs have grown into the tree and become a part of it; and those which have been thus treated, though somewhat retarded in their

growth, are now apparently as thrifty as those which have not been thus injured.

I have a house and yards for fowls on one side of the orchard within the inclosure; and it is my present intention to raise a crop of tobacco on the ground next season, and allow the fowls free range over the field to feed upon and destroy the worms, &c., the crop of tobacco being almost the only one which fowls do not injure.

Pear Trees.

D. C. Brewer's Statement.

The orchard of young pear trees which I offer for premium, consists of forty trees which were set in the spring of 1850. The land on which they stand is a sandy loam; it had been cultivated for two years and was in a good state for transplanting.

The varieties are as follows:—Bartlett, Seckel, Beurré Bosc, Beurré Diel, Beurré de Amalis, Louise Bonne de Jersey, Flemish Beauty, Henry IV, Frederick of Wurtemburg, Madeline, Vicar of Winkfield, Beauty of Automne, Marie Louise, Urbaniste, Van Mons Leon le Clerc. In the spring of 1850 I dug the holes for the trees, fifteen by twenty feet apart. I made them fifteen inches in depth and four feet broad, and mixed with the soil, some compost to each hole; I then set out the trees; they all lived and made wood, from one to two feet the first year. They are now looking healthy and vigorous, have made from two to three feet growth the past season; quite a number of the trees bore this year; the fruit was large and fine.

Peach Orchard.

D. C. Brewer's Statement.

In the fall of 1848, I made preparations for setting my peach orchard, and in the spring of 1849, after preparing my ground, (which was in a barren and uncultivated state,) by a

deep and thorough ploughing, and then digging very large holes to be partially filled with rich loam, before setting the trees, after which I used a compost consisting of muck, stable manure, ashes, coal cinders, &c., to be placed around the tree while setting and afterwards, to be worked in with a fork, keeping the roots, while setting, in their natural position, and occasionally shaking the tree that the fine compost might find its way down through and among the roots. Since then the land has been cultivated, raising mostly potatoes, which I consider the best crop that can be raised among trees, and in truth I really think them an advantage, as the ground is generally kept loose and free from weeds. The trees have been inspected two or three times in the course of a season to keep them from the grub or borer, which, if allowed to enter an orchard, proves almost a sure death to the trees. The orchard consists of one hundred and fifty trees, which have been regularly pruned, thereby causing them to form better heads or tops than if left alone, and making much better looking trees. The following are the varieties which, according to my views, are as good a selection as I could well have:—Early York, George IV, Cole's Early Red, Coolidge's Favorite, Morris' White, President, Crawford's Early, Crawford's Late, Old Mixon, (free stone,) Royal George, Red Rareripe, Tillottson's Early, and Early Newington.

Josiah Hooker's Statement.

My peach orchard consists of one hundred and twenty-eight trees—forty-five of which were set out last spring. The others were planted in 1848 and the two years following. The position of most of them is on a gentle slope, having a westerly aspect. They are at a distance of about fifteen feet from each other. The trees have been, from time to time, well washed, and ashes and manure have been put around the roots; and care has been taken to keep the soil loose around them, with the spade.

D. A. Wells's Communication.

Cambridge, *September*, 1851.

To the President of the Hampden Co. Agricultural Society:

You request that I would communicate to the Hampden County Agricultural Society, such facts in regard to the examination and analyses of soils as I may be possessed of, and which in my opinion may subserve the agricultural interests of Hampden county. It gives me great pleasure to comply with your request so far as I am able, and although my experience has been somewhat limited, yet impressed with the feeling that the main object of investigators and promoters of agricultural science should be the collection of facts having a practical bearing upon the wants of the agriculturists, I furnish, without distrust, the result of my investigations and observations.

In May, 1851, I was intrusted by the secretary of the Ohio State Board of Agriculture, with the office of examining, analyzing, and reporting upon the nature and composition of the soils of that state, and upon this work I have been actively engaged during the past summer. The question which presents itself before me at the present time is this:—Is there anything of profit or interest applicable to wants of the agriculturist of Hampden, to be drawn from these investigations of Ohio soils? The fertility of the rich lands along the valley of the Scioto and Miami Rivers, is known world wide. The sterility of Massachusetts soils, and of the soils of New England generally, with the exception of some alluvial deposits along the river bottoms, has an almost equally extensive reputation. Will the results of complete and accurate chemical analyses show a reason for these differences, and at the same time indicate a remedy wholly or partially effectual? This question may perhaps best be answered by a comparison of the analyses of some of the best soils in Ohio, with the analyses of soils from Hampden county; and with this end in view I submit the following abstracts of the analyses of five soils; two from Ohio and three from Hampden county. The first is the analysis of a soil from the Ree-Ree Bottom, in the county of Pike, embraced in the district known as the Scioto Valley,

and occasionally overflowed by the Scioto River. It has been cultivated fifty-one years; forty-five crops of corn and two or three of wheat have been taken off from it; it has also been a few years in grass or clover. It has scarcely diminished in fertility, and now, with the most ordinary culture, yields on an average, one year with another, eighty bushels of corn to the acre.

Analyses.

Whole amount of insoluble matters, silicious sand and clay,	83.00	per ct.
Lime,	0.4	"
Phosphoric acid,	0.04	"
Alkalies,	0.16	"
Organic matter,	6.00	"

Another soil from the Scioto Valley, equally productive, and cultivated for eighteen years in the simplest manner, gave the following results:

Insoluble silicates, clay and sand,	79.00	per ct.
Lime,	1.00	"
Alkalies,	1.00	"
Phosphoric acid,	0.2	"
Organic matter,	11.0	"

Compare now with these two analyses of soils, among the best in the world, three from the county of Hampden, as given in the Geological Report of Massachusetts, by President Hitchcock. The first an alluvial soil from West Springfield:

Insoluble silicates, clay and sand,	93.00	per ct.
Lime, as sulphate or as gypsum,	1.3	"
Phosphates,	0.7	"
Organic matter,	4.0	"

Another soil, resting upon the red sand stone, from Longmeadow:

Insoluble silicates,	92.00	per ct.
Lime, as sulphate,	3.0	"
Phosphates,	0.6	"
Organic matter,	3.7	"

A third soil from Palmer, gives us the following:

Insoluble silicates,	88.00	per ct.
Phosphates,	0.6	"
Lime,	2.0	"
Organic matter,	8.0	"

In comparing these several results, we find but little difference in the amount and value of the mineral constituents of the Ohio and Hampden county soils; if anything, the advantage is on the side of the Massachusetts soils. The reason for their respective differences in value, will not, therefore, be probably found here.

How is it then with the organic portion of these soils? Here there is a difference. The three soils which I have selected from Hampden county, contain a greater proportion of organic matter, than the general average. This element of the different soils will generally be found to be greater in the rich Ohio soils than the soils of New England. Compared with the alluvial lands along the rivers of New England, the excess is not very considerable. But there is a very great difference in the state and condition in which this organic matter exists in the soils of the Scioto, and the soils along the Connecticut. In the former, it is so finely divided, so blended and incorporated with the mineral particles, that few, on examining the dry, pulverulent soil, would be able to form a fair comparative opinion respecting the quantity present. The amount would always be underrated. A very large part of this organic matter is also in a soluble state, ready to be appropriated and received as food by the growing crops. On the contrary, much of the organic matter in the soils of New England is coarse, recently derived from decayed animal or vegetable organisms, and perhaps not yet thoroughly decomposed. It is also in considerable part insoluble, or in a state allied to, and resembling charcoal.

A microscopical examination of the insoluble portions of the Ohio soils, the silicious clays and sands, shows that they have had an origin common to the great mass of the New England soils. The rocks underlying the soils of Ohio are for the most part lime rocks, and the same is true of the soils of Iowa

and Wisconsin. Yet my examinations of Ohio soils, and the examination of other analysts, together with the analyses of the soils of Iowa and Wisconsin, by Dr. Owen, the United States government geologist, show that the quantity of lime present is no greater than the average amount contained in New England soils. The soils of the three western states referred to, and perhaps the soils of all the west, have been derived from the ruins of granitic and primitive rocks, swept and distributed from the north by powerful aqueous agencies.

There is one other point in which the Ohio soils examined by me, differ from New England soils, and that is, in the fineness of their constituent particles, most of them being little else, when dry, than impalpable powders. This is an important element of their fertility, for with it a superior power is at once given to a soil for the absorption, retention and condensation of moisture, carbonic acid and ammonia, with an opportunity for the free permeation of atmospheric air, and a facility for the rootlets of plants to extend, appropriate and receive nourishment.

The conclusion then to be drawn from this comparison of the soils of the Scioto Valley and the soils of Hampden county is, that the Ohio soils are only superior as regards the fineness of their constituent particles, and in the amount and condition of the organic matter contained in them. The lesson which they may teach to the agriculturists of Hampden is, the necessity for the thorough breaking and pulverizing of the earthy particles, and for the preservation, preparation, and proper application of organic manures, the produce of the farm yard and the muck beds. These conclusions are not new; they are the results of the experience of ages, and of the observations and experiments of every practical farmer. The agricultural tendency of the present day is toward mineral manures. I would not undervalue them, but at the same time I wish that the old notions respecting thorough tillage, and the value of the barnyard products—notions, the value of which experience has taught and which all scientific investigations are now confirming,—may not be underrated or undervalued.

DAVID A. WELLS,

Chemist to the Ohio State Board of Agriculture.

FRANKLIN COUNTY AGRICULTURAL SOCIETY.

The second anniversary and fair of this society were held at Greenfield, on the 15th and 16th days of October last. Three town teams were present. The entries of working cattle were 30, cattle for the stall 6, fat cattle 5, steers 27, bulls 12, and cows 11. James S. Grennell, of Greenfield, exhibited a Durham bull which weighed 1800, and Consider Arms, of Conway, a splendid pair of cattle weighing 4700 pounds. Hubbard Graves, of Sunderland, exhibited a sow and pigs of the Suffolk breed, accompanied by the statement that the sow had borne pigs, within a year and a half, which had been sold, as pigs, for $158 50.

At the horse show on the second day, the number of entries was of geldings 12, of stallions 5, of draft horses 2, of carriage horses 5, of breeding mares 12, and of colts 37.

The address before the society was delivered by Professor John P. Norton, of Yale College.

Ploughing Match.

There were twenty-four entries, but only eighteen competitors made trial. The ground was well chosen, a strong sward upon a stiff clayey soil. Although the least depth of furrow to be ploughed, had been fixed at six inches, the committee advised and urged the ploughmen to aim deeper than this depth—deep ploughing being considered decidedly preferable to shallow. The committee express the opinion that for future trials of this nature, the depth of furrow should not be less than seven inches. The work was all well done. The premiums were awarded, as follows:—

The first, of six dollars, to Josiah Fogg, of Deerfield; plough, Ruggles, Nourse & Mason.

The second, of five dollars, to J. S. Grennell, of Greenfield; plough, Ruggles, Nourse & Mason.

The third, of four dollars, to Albert Smead, Greenfield, do. do. do.

The fourth, of three dollars, to Josiah Fogg, Deerfield, do. do.

The fifth, of two dollars, to A. H. Nims, of Greenfield, plough, Prouty & Mears.

A premium had been proposed for a plough without a holder, and at the close of the match, such a plough was put in, by E. G. Stebbins, of Deerfield, and drawn by horses. Although the work done by it exceeded the expectation of the committee, yet it was not performed to their entire satisfaction. The plough was of the manufacture of Prouty & Mears. The experiment, if not entirely practical, was designed "to stimulate the ingenuity and tax the skill of the plough-makers," and it should have this effect.

Three ploughs with double shares, the "Michigan ploughs," were put in operation, each drawn by two pairs of cattle. Their work appeared to be well done, especially for some purposes of culture; but in the absence of all experience and observation of their utility, the committee are not prepared to express a decided opinion thereon.

GEO. GRENNELL, *Chairman.*

Town Teams.

The committee say that the team from Shelburne was, in the opinion of the committee, the finest, heaviest, and best matched in form and color, of any team ever shown in Massachusetts, and to the town of Shelburne they awarded the first premium. To the town of Greenfield they awarded the second.

Cows.

Among the cows were some superior ones, and all were fine and worthy of notice. A red cow, eight years old, half native

and half Durham, owned by Josiah Fogg, of Deerfield, in seven consecutive days yielded four hundred and sixty-five pounds of milk, from which were made seventeen pounds of butter. She is of medium size, except her *milk-holder*, which is as large as ever cow swung. She dropped her calf the 7th of September last. The first premium of six dollars is awarded to Mr. Fogg.

Elam Kellogg, to whom is awarded the second premium of five dollars, presented a cow which dropped her calf November 19th, 1850, and after supplying milk for two families of nine persons, furnished, between December 3d, 1850, and August 23d, 1851, milk from which two hundred and sixty-eight pounds of butter were made. The greatest quantity of butter made during six consecutive weeks, was ten and a quarter pounds per week.

It is much to be regretted that so few cows were offered for premium here, in the midst of the finest cows and stock of the State, and the committee are constrained to believe that it is owing mainly to the stringent rule of the society, requiring quantity and weight of milk and weight of butter, for a number of consecutive weeks, not less than six. They would, therefore, suggest the relaxing of so stringent a rule, and adopting one more easily complied with—a trial of one week in June and one in September, if the calf be dropped in the spring, and if dropped after June, then seven or ten days in September, or before the fair, will be found to be a more satisfactory and sufficient test.

H. G. NEWCOMB, *Chairman.*

Cheese.

We are confident that we cannot too strongly urge upon the dairyman the necessity of using the greatest care in the selection of cows for his dairy. Very much depends upon this. Milk is found, upon analysis, to contain the principal materials of animal matter, albumen, oil and phosphate of lime, and these in much larger proportions from some cows than others. Good rich milk is as necessary for making good cheese as it is

for making good butter, for the quality and flavor of the cheese depend in a great measure upon the cream or oily matter that is left in the curd. You might as reasonably expect richly flavored fruit from the crab-apple tree, as good cheese from poor, thin milk, that challenges the sky to compete with it in color.

Away, then, (if you have them,) with your little, blue-skin, goat-like imitations of a cow, and supply their place with the noble, rich yellow-skin, every way worthy of the appellation of "Madam Cow." And having done this, see that the business of the dairy, in all its departments, is performed systematically, and with the strictest regularity. Let the process of milking be done at regular hours, and avoid, as far as possible, a change of milkers. Then provide the good woman with every necessary convenience for carrying on her work, and if she be fully qualified to act well her part, success will crown your efforts. Then will the loaded shelves bend beneath the weight of the rich product of your labor, and your pockets be well filled in return for the fruits of your honest toil.

E. WING PACKER, *Chairman.*

Grain and Root Crops.

There was awarded

To D. & H. Wells, of Shelburne,	for Indian corn,		$5 00
" D. & H. Wells, "	" wheat,	-	3 00
" James Childs, of Deerfield,	" rye,	-	3 00
" Aaron Budington, of Leyden,	" carrots,	-	2 00
" Oliver Williams, of Sunderland,	" turnips,	-	2 00

D. & H. Wells's Statement.

The acre of corn, which we entered for premium, was on a moderately stiff loam, with an eastern slope varying from six to twelve degrees. The land had been liberally manured and planted to corn, then sown with oats and grass seed, and mowed fourteen years without any dressings except plaster. Last year the crop of hay was over a ton to the acre.

Last April, the land was ploughed with a side-hill plough, turning all flat, furrows seven inches deep. Twenty-three loads of green manure were hauled on, which were spread and harrowed in at the time of planting, May 19th. Ten loads of rotten manure, made under cover and sheltered through the summer, were put in the hill. Three hundred pounds of plaster were used, a part on the manure in the hill, the remainder sowed on after the first hoeing.

Owing to the steepness of the slope, the rows were furrowed three feet six inches apart, the hills three feet in the rows. Planted the eight-row corn, using a liberal suppy of seed to guard against worms or other injury. At the first hoeing, thinned to five stalks in the hill. Hoed three times, using the cultivator each time. The corn was harvested by cutting up at the ground, and putting it in shocks of twelve hills each, while a small portion of it was quite soft, lest it might be injured by the frost. The corn was carted, husked and carefully measured early in November. A portion of it, shelled soon afterwards, gave a yield of one hundred and nine bushels, three pecks.

Estimated Expense.

Thirty-three loads of manure, -	$33 00	
Plaster, - - - -	1 35	
Ploughing, and hauling manure, &c., -	8 00	
Spreading manure and harrowing, -	1 50	
Furrowing 75; seed 33, - -	1 08	
Planting $3; hoeing and cultivating, $8 50,	11 50	
Cutting up and shocking, - -	2 00	
Carting and husking, - -	8 50	
		$66 93
By 109¾ bush. corn at 70 cts. per bush.	$76 81	
3 tons corn fodder, - -	15 00	91 81
Balance in favor of crop, - - - -		$24 88

It will be seen that we have made no allowance for the benefit, which after-crops may receive from the manure. We also

submit the following statement in regard to a crop of spring wheat, raised by us this season, on one acre and seventy-three rods of land. The yield was fifty-one bushels, or a fraction over thirty-five bushels per acre, weighing 61¾ lbs. per bushel.

The soil is a stiff loam, and had been in grass seven or eight years, previously to 1850, without manure. In the spring of that year, spread thirty loads of green manure, (about thirty-five bushels to the load,) and turned it under the sod, ploughing six inches deep, and planted to corn. Twenty bushels of ashes, four of air-slacked lime, and two of plaster, well mixed, were applied in the hill. The estimated yield was seventy-five bushels to the acre.

This year the land was ploughed once, the seed thoroughly harrowed in, and the land rolled. Sowed, April 2d, the Black Sea wheat, at the rate of two bushels to the acre. Prepared the seed by soaking in brine twelve or fourteen hours, then rolling it in lime. In May, after the wheat was well up, the field was sown with plaster, about 150 lbs.

Expense of Cultivation.

Three bushels of seed, $1 50 per bushel,	$4 50	
Ploughing, preparing seed and sowing,	3 50	
Harrowing and rolling, - -	1 50	
Harvesting and carting, - - -	7 75	
Lime, salt, plaster, and sowing same, -	1 25	
Threshing, (by horse-power,) - -	3 00	
		$21 50
Fifty-one bush. of wheat at $1 33 per bushel,	67 83	
Straw, - - - - -	8 00	
		75 83
Profit,		$54 33

Shelburne, *Nov.*, 1851.

James Child's Statement.

The crop of wheat, which I enter for premium, was raised on one acre and twenty-seven rods of land. It was stocked down to clover in the fall of 1848. The summer of 1849, a

crop of rye was cut from it. Last year the first crop of clover was cut for hay, and the second crop (about three-fourths of a ton per acre) ploughed in. It was then, (Sept. 19th) sowed with two bushels of the Soule's variety of wheat. The yield was twenty-nine bushels and thirty quarts to the acre, or thirty-five bushels on the entire field. The soil of the field is a sandy loam, of a medium quality. I also present for consideration a field of rye, four acres and fifty-three rods, the culture of which has been precisely like that of the wheat field, for a few years past, it being a part of the same lot. The yield was 120 bushels, or twenty-seven bushels, twenty-two quarts to the acre.

Deerfield, *Sept.* 25, 1851.

Aaron Budington's Statement.

Previous condition of land, soil good, a deep loam. Part of the land had carrots on it for three years past, the rest one year.

Manured with fifteen loads stable manure, -	$15 00
Ploughing and sowing, four days, - -	4 00
Weeding and thinning, twelve days, - -	12 00
Harvesting, eight days, - - -	8 00
Seed, one pound orange carrot, - -	1 00
	$40 00

Spread the manure before ploughing. Began to plough on one side, with a side-hill plough, letting it run as deep as we could make it; ploughed one rod in width; then raked the stones and lumps of dirt into the dead furrow, and proceeded in that way until finished. Sowed with seed sower; the rows on one half of the piece eighteen inches, and on the other half two feet apart. Thinned the carrots in the former rows to one foot apart, and the rest from eight to ten inches. Raised 384 bushels on half an acre of land.

Leyden, *Nov.*, 1851.

Oliver Williams's Statement.

The land, on which my half acre of turnips grew this season, is sandy loam. The condition of the land was good. It had been in grass for two years, previously. I turned under the sward about the middle of July, after mowing, cutting the furrows eight inches deep.

Ploughing and harrowing, - -	75	
Five loads of compost, - - -	5 00	
Carting and spreading same, - -	1 00	
Seed and sowing, with machine in drills,	40	
Hoeing and thinning, - - -	1 75	
Harvesting, - - - -	3 00	
		$11 90
By 364 bushels turnips, at 25 cents per bushel,		91 00
Profit,		$79 10

Sunderland, *Nov.*, 1851.

Hay Crop.

One of the best mowing lots in this State is in Greenfield, and is owned by H. W. Clapp. It contains, by accurate survey, seven acres and one hundred rods. In 1850, the first crop of hay on this lot, harvested in July, weighed at the time, - - - - - 29 tons, 497 lbs.
The second crop on the same lot, harvested in September, weighed, - - 14 tons, 97 lbs.

Total, 43 tons, 594 lbs.

HAMPSHIRE AGRICULTURAL SOCIETY.

The cattle show of this society was held at Amherst, the 22d day of October last. The exhibition opened with the trial of horses, the number, quality and appearance of which, received general commendation. The whole number on the ground was 123, viz.: five stallions, twelve geldings, forty work-horses, twenty-two breeding mares, and forty-four colts. The show of cattle was very extensive, numbering five hundred in all, viz.: five calves, seven milch cows, nine heifers, twelve bulls, sixteen fat cattle, sixty steers, and 390 working oxen.

Of town teams, the Belchertown string contained 202 working oxen, in pairs, decorated with banners, and attached to a spacious car, appropriately decorated and occupied by 181 persons, including a band of music. The Granby string was composed of eighty-eight excellent cattle, and the Leverett string of forty-eight. Parsons West, of Hadley, exhibited eighteen very nice working oxen, from his own farm.

The number of entries for the ploughing match, was twenty-three. Sixteen lots were ploughed. The land was hard, somewhat stony, and adapted to exercise the highest skill of holders and ploughs. The Michigan plough, with two coulters, was much admired. The ploughing was creditable to all the holders, and very attractive to the spectators.

There were twenty-five entries for the trial of working oxen. The load was stone, about two tons in weight, drawn up an ascent in the highway of six or seven degrees, by single teams.

The show of poultry was large, consisting of six hundred specimens. Of fruit, there were 404 plates, with not less than five specimens on each plate, and of bread, 102 loaves; thirty cheeses, and twenty-two lots of butter were also exhibited. The other departments were well filled.

The address was delivered by Hon. Marshall P. Wilder, of Dorchester.

ALFRED BAKER, *President.*
J. W. BOYDEN, *Secretary.*

Subsoil Ploughing and Compost Manures.

Subsoil ploughing has not, in this region, as yet arrested the attention of farmers, as its importance deserves. The operation of the double coultered plough,—called the *Michigan plough* in this country, but *Morton's plough* in Europe,—will, we hope, be the means of exciting more interest in the subject.

From the known *downward* tendencies of the chairman of the committee, the society will not think it strange if he gets a little nearer to the rocks than the subsoil plough reaches. He will, therefore, venture to suggest a mode of enriching land, to which he called the attention of farmers in his final report on the Geology of Massachusetts, but which probably has been forgotten. It is well known that some of the most valuable manures are soluble in water, and such, of course, are carried downwards through the soil as deep as the water penetrates. This will in a great measure descend till it meets with a stratum of hard pan, or clay, that is impervious to water; thence we may expect that the deposit lying immediately above such impervious stratum will contain salts, valuable as manure, if brought to the surface. This has been proved by several facts, which are cited in the report above alluded to, under the head of *muck sand*, (p. 107.) But the water-bearing stratum, whether loam or sand, may lie near the surface; and this may be one of the secrets of the good effects of subsoil ploughing. In many cases this stratum may be recognized by the springs that issue from it in steep banks; and it may prove more valuable than even subsoil ploughing.

On the subject of compost manures, two statements were received: one from Samuel Powers, of Hadley, to whom the committee award the highest premium of ten dollars; and a

second from Dr. David Rice, of Leverett, to whom the committee recommend a gratuity of six dollars.

EDWARD HITCHCOCK, *Chairman.*

Samuel Powers's Statement.

I have, during the last four years, been in the habit of using compost manure to a considerable extent, and from the experience that I have had in its application, and the results that have attended its use, I now think it far cheaper and equally as durable for a fertilizer, as the best animal manure. In 1847, I took from my peat swamp, the soil of which is composed of vegetable matter, that has been accumulating there for many years, about one hundred and twenty-five cart loads of this peat, and mixed with it ashes, saltpetre, and plaster, in parts, equal to one hundred bushels ashes, one hundred pounds of saltpetre, and five hundred pounds plaster, for the whole lot. In the spring of 1848, I carted this mixture upon a field adjoining, the soil of which is a fine deep loam capable of being enriched to any extent, and spread upon two acres, fifty large loads of compost, harrowed it in and planted it with corn. Upon two acres adjoining, of precisely the same quality, forty loads of good yard manure were applied. The result was, the corn on both pieces was good, yet that on which the compost was used was more luxuriant from beginning to end, and produced some seventy-five bushels per acre. After harvesting the corn, one acre of the land composted was sown to wheat, and the other acre to rye; both crops were good, the part sown to rye producing about twenty-five bushels, and the wheat twenty bushels. And had not the frost killed it out, it would probably have yielded thirty bushels. The rye sown on the two acres manured, produced twenty bushels per acre.

In 1850, I planted the same four acres again, adding ten loads of compost, making sixty loads for the two acres, and putting the same quantity of manure upon the other, it produced a very heavy crop of corn. After harvesting it, I sowed it again with wheat and rye, and produced as good a crop as before.

In the spring of 1851, I sowed grass seed and harrowed it in among the growing crop, and it now presents a very promising appearance. My object in experimenting upon these two pieces of land, has been to test the qualities of compost, and its utility in preserving the qualities of the soil, which has been done to my entire satisfaction, both parcels being raised from a low to a high state of cultivation, and can, I think, be mowed for several years to come with good success.

My anticipations have been more than realized, both in regard to the productiveness of the land, and future prospects of the crops, which are all in favor of composting, one important consideration of which is its cheapness, the cost not exceeding thirty-three cents per load, on the lot, or about one-third the expense of animal manure. My practice is to mix the compost one year, and use it the next. I have also applied it on several other parcels of land, with equal results. In 1849, I put fifteen loads of compost on one half an acre of land beside the same quantity of land on which was spread at the rate of twenty-nine large cart loads of manure to the acre. The corn grown from the compost was the best and produced forty bushels. I also spread twenty loads on grass as a top dressing, and experienced the same results. In 1851, I applied to one acre about forty loads of compost, with nothing but plaster, to as good purpose as heretofore, for the growing of corn. Also thirty loads to another acre of corn, and procured about the same as when twenty loads of manure were used, side by side. In all cases where this compost has been used, not only has it produced good crops, but it has much improved the land, so that it is now in a good state of cultivation.

Hadley, *Oct.* 20, 1851.

David Rice's Statement.

I present the following statement in regard to a compost manure that I have used and tested for several years. It recommends itself by several considerations. I state in the outset, that the two great objects to be looked after in making manures, are *cheapness* and *strength.* A strong fertilizing manure, but *costs but little,* is what farmers most desire. The experi-

ments that I have made, have not been on a large scale, but large enough for the deduction of facts, which I wish to state to the committee.

Immediately after planting in the spring, and after I have used what manure I want, I commence my compost heap for the next season. Into a convenient place, which with me is a hollow in the angle of a bank wall, on the south end of my buildings, I deposit first a load of horse manure. Over this I usually spread the scrapings of my wood yard and cellar, especially in May, and all other refuse substances that will make manure, that I find about my buildings, such as the rakings of the yard and old leaves, &c., making in all another small load. Over this I add a load of loam, then over the whole I spread about a bushel of ashes. For the next three or four weeks this heap receives from the washroom, all the soap suds and washing water, and from the house all the useless slops and washings of the kitchen, sweepings, &c., being kept continually moist. In about four weeks after the first deposit, I add another load of horse manure, more loam and sand from the washings of road drains spread over the horse manure, and over all, a layer of wood ashes, occasionally adding more during the next four weeks. This heap for the succeeding four weeks, receives as before, all the fertilizing substances that accumulate in the wash-room and kitchen. This process is continued during the summer and fall, until snow covers the ground, and then I call my heap finished, only as it continues to receive during the winter, washings, slops, &c.

This manure I have usually applied to corn land, but never expecting to make any written statement as to its fertilizing qualities, I have not tested it as methodically as I otherwise should have done. I have tried it by the side of good barn manure, and by the side of good hog yard manure, and it produces a heavier growth of corn than either. I noticed, particularly this season, that where I manured corn in the hill with my compost and hog-yard manures, a load of each being deposited side by side, on equally good land, that corn grown over the compost manure was the most vigorous, darker col-

ored, and produced quite as large a crop in harvest time, as that grown over the hog-yard manure.

I have tried it also in the hill for potatoes, and find it fully equal to the best hog-yard manure. I claim for this manure the following advantages:

First it is *cheap*. Horse manure *alone* is a miserable fertilizer, and this, excepting the wood ashes, is the only substance of any value, that enters into the composition. Combined in the way stated, it helps to form a valuable manure. Loam and washings from the road side, cost nothing but the labor of getting them. All the refuse substances around the house, cellar and yard, are got rid of as nuisances and converted to a valuable purpose. The wood ashes lose nothing of their value combined in this way, but rather are rendered more useful by imparting their virtues to other substances, making a compost more fertilizing than ashes could be alone.

Again, as a matter of cleanness and convenience, this compost heap is of great advantage. How often do we see around farm houses and farm yards, accumulations of substances rendering the premises filthy and unsightly. The compost heap receives all these otherwise useless accumulations, and greedily drinks in all the slops and washings that otherwise would be forming dirty and offensive drains about the premises; but in this way, they are fitly and economically disposed of.

LEVERETT, *Oct.*, 1851.

RECLAIMED MEADOWS.

The committee, in examining five tracts in Hadley, Amherst and Belchertown, have had their attention called to the importance of this subject generally in its bearing upon the agricultural interest of the Commonwealth. In the history of the settlement and early growth of the towns in Massachusetts, as in the other states, the settlers brought into cultivation those portions only of the forest land which they could subdue with the greatest ease, and which would yield the quickest and largest returns; while those portions which required great

expense and labor to be brought under cultivation, and which would yield returns of profitable crops but slowly, were suffered to remain wholly unimproved, or were partially reclaimed, so far that they would yield some pasture, or some coarse grass for the scythe.

This mode of procedure might answer well enough while there was an abundance of good land easily reclaimed, while the population was sparse and the consumers comparatively few. But as the population increases, and the demand for agricultural products increases, the producers must change their mode in this respect, and must put under cultivation a greater amount of fertile land in order to meet that demand.

Now it is well known to those who have taken into consideration the unimproved land in the several counties in the State, amounting by the returns in the aggregate to seven hundred and fifteen thousand two hundred and ninety-four acres, that a very large part of this land, amounting, by the same returns, to four hundred fifty-seven thousand two hundred and sixty-five acres, grown up to wood and bushes, or under the dominion of water, might be reclaimed and made productive.

Some land of this character has indeed been partially reclaimed; but trees and bushes, roots and stumps, stones in place and out of place, obstruct the scythe and the rake. The ground is too wet and soft for the plough and even for the cart. The grass is of but little value for the purpose of nutrition, and if mowed, is used chiefly for litter.

But there are extensive tracts of low land in a still worse condition, covered with sedge and brakes, bogs and moss, or so tangled with bushes and trees, that as one remarked to the committee, a "grey rabbit could not find his way through it." Here gad-flies and bottle-flies, musquetoes and midges have their native home. Here frogs and lizards, the water-snake, and, it may be, the copper-head, have their haunts. From it, evaporation chills the neighborhood, and malaria generates disease and death. You step on it and it quakes beneath your feet.

For land in this condition the true remedies are DRAINING, and PLOUGHING. The first is essential to the second. The second is as essential to success as to the object aimed at in the

process of reclamation. Beside the spade and the plough, the axe often has an important office to perform in clearing off wood and bushes.

The first thing is to get rid of the water. It is true that a certain amount of water is necessary for the germination and the subsequent growth of plants, both as the medium of aliment and as itself furnishing certain elements which enter into their composition. But an excess of water operates as injuriously on the fertility of land as does the excess of dryness. And it is as important that the one should be corrected by draining, as it is that the other should be corrected by irrigation. Whether the excess of water is on the surface, or on the subsoil, or issues from strata cropping out, draining, either from the surface, or from the subsoil, or from strata sending forth springs as at the bottom of hills, is the pioneer process for other improvements.

The land requiring to be drained is not unfrequently found to contain largely those elements which enter into the composition of valuable vegetable products. It often happens that the finer parts of the soil are washed down from the hills. It often happens too that from the falling leaves and the annual decay of vegetation, there has been an immense accumulation of vegetable matter on the surface, which, by proper means, can be decomposed and thus be prepared to enter into other crops, whether roots, grains, fruits, or grasses. For ages, the work of saving has been going on. By the exclusion of air, by a low temperature, by preservative qualities in the water or soil perhaps, Providence with prescient care has laid by for future use these immense stores of vegetable matter in the form of peat for the nourishment of future plants; just as Providence has also laid by immense stores of vegetable matter in the form of coal, for the future use of man. In this way nature has hoarded up treasures of untold value for those and those only who know how to use them.

It is true that in this preserved organic state, peat is unfit for nourishing plants. But take a cart load of it from its place, while in this state, in which can be seen the texture of the leaves, the grain of the wood, the cortical layers, the stalks and

stems and fibres of plants like the sedges and grasses, and expose it on high ground to the heat of the sun, and to the drying winds, and to frost and rain; turn it over occasionally with a shovel, mingle with it half a dozen bushels of good animal manure; and to furnish the requisite earthy or saline matter in which it may be deficient, lime it, or ash it, or marl it, or clay it, or gravel it, or sand it, or loam it. Under this process it loses its organic character and becomes adapted to the support of plants. What is true of a cart load of this vegetable matter, is true of the whole mass in the meadow from which it was taken. By draining, by turning up to the sun, by the action of the air, of frost, and rain, by the addition of saline or earthy matter, by the use of the plough, the harrow and the hoe, by the addition of a small amount of appropriate manure, it becomes to some depth decomposed, and exceedingly well adapted to the support of vegetation. Its *character is changed by this process from an organic into an inorganic state, from barrenness into fertility.*

Beside changing the condition of the soil, this process increases *ease of cultivation.* The plough, the cultivator, the harrow, the hoe, the rake, which were impeded in their use before a thorough process was commenced upon land partially reclaimed and while it was in progress, can, after it is completed, perform their office with comparative ease. The work can not only be well done, but can be done at a less expense of force and time. The productive area of the farm is increased. Even if the redeemed meadow land should continue to be too wet for wheat and Indian corn, it will, by an abundant production of hay, leave the other parts of the farm at liberty for the production of such crops.

This process improves the *quality of the production.* It changes aquatic plants and coarse grasses into land plants and fine grasses, just as surely as it changes aquatic animals like the frog and the water-rat, for other animals like the horse and the sheep. Aquatic plants, with the exception of rice, which cannot be cultivated in our climate, are inferior to land plants. It not only changes the kind but improves the quality of the same kind, in accordance with the general law that vegetable

productions take their character from the soil, whether they are grapes or grass, or peaches or wheat.

This process of thoroughly draining land, by *removing stagnant water* which contains no carbonic acid for the nourishment of plants, allows rain and running water which contain this important ingredient, to have access to the roots to nourish them, allows the air also to find its way to the manure in the soil, to decompose it and make it soluble, and thus prepare it to enter into the composition of the growing crop. Thus too, by the withdrawment of water, the ground is often left porous for the free range of the roots in search of pasture, and gives them food that is not too much diluted. The farmer should constantly remember that stagnant water is not invigorating to a man or to a vegetable in comparison with rain or running water, even though they are both thirsty.

This process moreover *raises the temperature of the soil and of the air around*, and in this way produces the rapid growth of plants and their full maturity. You can be convinced of this by putting a thermometer a few inches below the surface in soil charged with water, and compare it with another soil, or by consulting your own sensations, or a floral calendar. Evaporation, a cooling process, is prevented by the withdrawment of water from the soil, and thus the temperature of the soil itself and of the air which passes over it, is raised so much as to hasten the ripening and thereby accomplish the saving of the crop, not only on the land itself, but also on that which is adjacent. This is a change equivalent to a change of latitude. This, in a northern climate like our own, especially in a northern exposure, is of the greatest consequence. Many a lost crop of Indian corn might have been saved.

This process favors the *hibernation and sleep of plants* which is essential to their health and growth. Plants in northern latitudes require sleep as the animal creation does. If certain plants are continually kept in a growing state they become feeble and short lived. You may see this in the transfer of northern trees, like the apple-tree for instance, to southern climates where there is no winter, which as a matter of course degenerate. Now it happens sometimes in low lands that springs come up

from below, or more frequently come out from the bottom of the hills on the margin of the meadows, at so high a temperature as to keep the grass in a green and growing state during the winter and thus produce a feeble growth in summer. Cut off the springs by what is called strata-draining, that is, by ditches at the bottom of the hills and near the margin of meadows, or by subsoil draining, and you restore a vigorous growth to the plants.

This process carried out fully, favors the *efficacy of manure.* Besides producing a more rapid decomposition by the withdrawment of water, it prevents the manure from being present to the roots of plants in a form too dilute and reduced. This is important especially in respect to the salts like nitrate of potash and the liquid manures generally. To attempt to nourish plants by manures too much diluted by water, would be like feeding a man constantly upon only a thin broth, instead of solid nutriment.

This process carried out to its completion, is *favorable to health.* This is not only by preventing the dampness, and coldness which operate to produce bronchial affections and consumptions, but also by its preventing the formation of malaria, which generate intermittent fevers and bilious affections. Facts are abundant in confirmation of this position.

This process of reclaiming meadow land *gratifies the taste.* It transforms barrenness and deformity into flourishing beauty. It makes it blossom like the rose. So that as you pass by it, adorned with its luxuriant summer growth, you are ready, in the language of the prophet, to say, " This land that was desolate has become like the garden of Eden."

This process of redeeming meadow land incidentally furnishes the means of *fertilizing other lands*, which need an additional supply of those elements which are furnished by the peat-muck taken from the ditches. An illustration of this is furnished by Samuel Powers, of Hadley. He employs a large number of hogs to elaborate this muck into its proper condition. It ought to be added that Mr. Powers has been eminently successful in redeeming the land entered for examination, as the premiums bestowed in past years tes-

tify. He and each of the five have presented examples to the public, of great value, which it is to be hoped will be followed. *Were the society to appoint a committee whose duty it should be to learn what number of acres of lowland has been recently reclaimed, and what number of acres might be advantageously reclaimed in Hampshire county, and report to the society*, it would probably call the attention of the public to the subject, and encourage the practice of reclaiming meadow lands.

Finally, the process of reclaiming meadow lands is *profitable.* In proof of this, we rely upon the following statements.

Your committee have been exceedingly gratified in the examination of the several pieces of meadow land, which were entered for the bounty of the society. In each and all we saw animating evidence of skill, perseverance, and success. In that success, whether we regard the change from deformity to beauty, from barrenness to fertility, from loss to profit; in that skill in the application of the rules of agricultural art, founded upon the principles of agricultural science, we see a pledge and an earnest of similar improvements to be extensively adopted elsewhere in this vicinity by other intelligent farmers.

We assign the first premium, of ten dollars, to John Shipman, of Hadley; and the second premium, of six dollars, to Leonard Barrett, of Belchertown.

WILLIAM C. FOWLER, *Chairman.*

John Shipman's Statement.

I present to you my experience in reclaiming swamp land. Although more than twenty years have passed away since I commenced, I will endeavor to give you as correct a statement as possible.

In April, 1825, I came into possession of fifty acres of swamp land with which I had been familiar from my earliest youth. Forty acres of this land is a peat swamp. Being perfectly level, it had in some former years been covered with a large growth of timber, of pine, maple, oak, &c., which had been destroyed by frequent burning. I well recollect fifty years

ago it was literally covered with fallen decayed timber. At that time there were but few living trees, and but little brush on the land. There grew annually rushes, or as it is called by some, bull grass, to the height of six or seven feet, and very thick. This grass, during autumn and winter, fell to the earth, and in spring and often in midsummer, the land was covered with water to the depth of two feet, so that not a particle of the ground could be seen.

The land is situated about one mile north-east of Hadley. It is bounded on the east by a steep hill, from which run large and numerous springs. At the time I bought the land, it had grown up to brush and small wood. I did nothing towards draining it the first year.

In August, 1826, it being a very dry season, I commenced work with six men, and dug a drain north and south through the centre, six feet at the top, four feet at the bottom, and three and a half deep. As the lot was forty rods in width, I thought it best to have a large drain through the centre. We then commenced on the outlet, which is about one mile to where it enters the Connecticut river; one hundred and sixty rods of this was through higher ground. We had to go from six to ten feet in depth. It was a sandy loam very easy to shovel, but being so deep, it was an expensive job. We got a fall of three feet in the one hundred and sixty rods. We then commenced at the foot of the hill to cut off the springs. Here we dug a drain three feet at the top, three feet deep and eighteen inches at the bottom, with several cross-drains three feet six inches deep, three feet in width at the top, and eighteen inches at the bottom. The water passed off freely through all the drains, and I felt confident of success.

In the next spring, 1827, as soon as the ground was bare of snow, but the frost not out, I went to view the ground. I found it worked well, beyond my expectation. The deep cut was partly filled with snow that had drifted in during the winter, yet the water passed freely under it. There was but little water in the drain that cut off the springs at the hill, and there was no water on the surface of the land. But there were difficulties to come, that I did not then fore-

see. After the frost was out and the ground settled, I went to the lot, expecting it was fit to plough, but I found I had built my works on the sand, and they had fallen. The deep cut at the bottom was quicksand, the water had washed under the banks, and when the frost came out, it caved in on both sides almost the whole length, one hundred and sixty rods, filling up the ditch, leaving a vast chasm ten feet wide at the top, stopping the water which set back upon the land, completely covering forty acres, so that not a particle of it could be seen. It now seemed as if the work must forever stop. As I stood and looked at the ruins, I thought the matter over, whether it was best to turn the lake as it then was into a fish-pond and give up draining, or say as did David Crockett, "never give up but go ahead." I finally decided upon the latter, and again went to work.

This time I did it thoroughly, carted off the dirt, and spread it upon the land. About the 1st of June, 1828, the land became dry and we commenced ploughing. This required three men and four pair of cattle, with a large plough which cut fourteen inches in depth. When digging the drain, we found large trees two to three feet in diameter under ground, which were burnt to charcoal on the outside. In ploughing, these were a great hindrance. We ploughed about one half acre per day, getting out all the logs and roots. This team I kept on the land constantly in fair weather for four months. About one hundred days, in this time, they ploughed, dragged and cleared off the logs and roots from the remaining ten acres. Thirty acres I ploughed the next season. I then sowed ten acres with rye, and two with wheat. Both grew well, and there was as large a growth of straw as I have ever seen on any land, but both blasted and were nearly worthless. I have since that time tried rye, wheat and oats, in small lots, but am satisfied they cannot be grown on this land. I next sowed buckwheat with good success, and followed with this eight years in succession. At this time, I found the top of the land, the depth ploughed, had greatly changed.

The peat was from two to eight feet in depth, and of a reddish color before exposed to the air; it had now, to the depth ploughed, become black and very fine.

I now began to think of changing the crop, fearing it might exhaust the land if continued in buckwheat. I next planted broom-corn and potatoes, using five loads of compost manure to the acre, in which I put one bushel of lime per load. From eight acres of corn, I had six hundred bushels, seventy-five bushels per acre. From ten acres of potatoes, twenty-five hundred bushels, or two hundred and fifty bushels per acre. The broom corn was six hundred pounds per acre. I have continued with the above crops for twelve years, with good success, with one exception. In 1843, I had ten acres of potatoes. There came a heavy shower, and some five or six loads of earth slid into the deep cut and flooded the land; the drain was soon cleared and the water off in less than twenty-four hours, but it spoiled the potatoes without doing any damage to the corn, or other crops. In 1849, I planted forty acres with potatoes, and had ten thousand bushels. I set a small piece with tobacco four years in succession; it grew well every year. Last season I set two acres, which produced seventeen hundred pounds per acre; this season I set fifteen acres, which is better than the crop last season; on the above fifteen acres, I put six loads of compost and eight bushels of lime per acre.

I now have given a history of reclaiming the land, with the produce, except the buckwheat, which was fifteen to twenty bushels per acre; average, seven hundred bushels annually, from forty acres.

I will now give an account of the expense.

The wood paid for clearing the land.

525 rods of drain, at 37½ cts. per rod, -	$195 00
160 " " at 40 " -	64 00
160 deep cut " at $2 " -	320 00
Ploughing, draining, &c., 40 acres, at $15 per acre, - - - -	600 00
Three years' interest before getting crops,	215 00
First cost of 50 acres, at $5 50 per acre,	275 00
Total, - - -	$1,669 00

The present worth of the land, 40 acres, at		
$150 per acre, - - -	$6,000 00	
10 acres, at $50 per acre, - -	$500 00	
		$6,500 00
Net profit, - - -		$4,831 00

If there is any error in the above account, it is in the present price of the land, as I might with safety add one thousand dollars more. I have been offered and can now take two hundred dollars per acre for twenty acres of the best of this land. There are hundreds, and I may say, thousands of acres in the county of Hampshire that may be reclaimed, and would be the most productive lands we have.

Hadley, *Oct.* 20, 1851.

Leonard Barrett's Statement.

According to my earliest recollections, the land was covered with bogs and a species of small low water brush. As long ago as I can recollect, my father used to mow the most of it, and got nothing but the very poorest kind of bog hay, and that we had to carry out to hard land by hand on poles, in most cases the ground being too soft to drive cattle across it.

But in process of time the grass mostly died out for want of draining, and the bushes took its place. At the decease of my father some thirteen years since, it came into my possession, and I resolved, after hearing and seeing some experiments on similar ground, to try my fortune at improving it. Accordingly I commenced cutting the bushes, and hired a drain dug the whole length of it, about three feet wide and one foot in depth, and the spring following, burnt it over to kill the small bushes. But I found in one season that my drain was not sufficient, and I sunk it a foot lower, which I found to answer very well, although I have had to clean it out and widen it twice since. After lying in this condition two years, I commenced bogging. I first took a small piece and cut the whole surface over just low enough to smooth it and take all the bushes and bogs, and piled them in heaps and carted off what I could get at, burnt the remainder and sowed the ashes over the ground, and then, after raking it smooth, I sowed my grass

seed, consisting of red clover, white clover, herds grass and fowl meadow, and raked it in.

I also tried bogging it deeper, turning the surface over and cultivating the bogs; and although this leaves a richer top, yet it takes a long time to subdue the weeds and wild grass in this way; and I find the better way, after having ditched around a piece, to cut and turn over the surface late in the fall, and let it lie until the next August or September; then, if possible, burn it as it lies, and sow your grass seed and rake it smooth; then, in the spring following, give it a slight dressing of manure, accompanied with a good portion of lime (slack) and plaster of Paris.

In this way I have brought this nearly useless land to bear two large crops of the best quality of English hay a year, for the two years that I have had it under trial.

I have given a very brief and imperfect sketch of my operation. And this I do, that the very large number of men of small means like myself, who own such land, may be induced to commence reclaiming without delay.

Belchertown, *Oct.* 18, 1851.

Ploughing.

If a regular turning over the soil, from a uniform depth of four, five or six inches, be the best thing that can be done preparatory to putting in the seed, then are our improved ploughs as nearly perfect as anything human can be; and certainly no one, who has witnessed the exhibition of this day, will doubt that our accomplished plough-men have approached perfection in their use.

Some of your committee, however, are disposed to question whether a uniform inversion of the soil from four to six inches in depth, is the preparation best adapted to promote fertility. We suppose it possible, that an operation very different from that of merely inverting the top soil, may yet be found preferable; and if so, then a mode of accomplishing it, different from any yet practised in this country, may be found advantageous.

We anticipate the time as not far distant, when the giant power of steam will be seen striding such of our fields as are entirely free from stones; rolling its shark-toothed cylinders through the soil; grinding to powder all coarse lumps; combing, currying, tearing to shreds all stalks and roots; and so pulverizing and mixing the whole, as greatly to increase the fertility.

But it would be folly to relax our efforts at improvement on existing means, for, in the first place, such a steam process may never come; in the second place, if it come, it can be applicable to only a small portion of our lands; and in the third place, it affords no relief for intervening time. We cannot live this year on the expectation of bread to be raised by steam next year. True wisdom, in this case, is, to seek for the most perfect preparation of soils, by means now within our reach. As yet, "much increase is by the strength of the ox," not of steam; and we do well to inquire whether the strength of this noble animal may not be better employed than at present, with all our improved ploughs, in preparing the soil for luxuriant crops. May there not be some mode of tearing up, pulverizing and mixing soils to a great depth, which, though perhaps more expensive, would nevertheless pay better than the present cheap mode of merely inverting the top soil?

The roots of most cultivated crops will run twenty inches deep, if you give them that depth of loosened soil. They run down, off, or upward, wherever they find the best food, and the best conditions for promoting the growth and perfection of the plant. They are endowed with an instinct about as unerring as that of cattle in the selection of their pasturage. We know not, and we probably never shall know, precisely, how plants grow. But we know that the leaves select the right nutriment from the air and reject the wrong, and that the roots are equally discriminating in their choice from the ground. He who has taught the fowls of heaven to observe their appointed times, has taught the roots of plants to seek unerringly, the right food and the best conditions—to run shoal, to secure the kindliest influences of the sun, to run downward for moisture, to run for food wherever food is found. Only give them

room and they will choose their direction wisely. If you bury an old shoe by the side of a grape vine, ten thousand rootlets will shoot towards it; while if you put in the same place a quantity of bog iron, they will all turn their faces from it. The roots of plants should not be confined, as by our common method of ploughing, to five or six inches of soil. They should have at least three times as much space, out of which to choose the proper conditions of moisture and dryness, of heat and cold, and to select food appropriate to the plant to which they belong. By loosening the soil to a great depth we secure the conditions which the plant demands. We create a porosity by which excessive rains pass off without injury; and we secure a capillary action by which water deep in the earth is drawn upward, when the surface would otherwise be too dry. We thus secure the plant against serious injury from hard rains or excessive drouth.

In soil loosened to a sufficient depth, there is always going on an equalizing process. If too much water falls on the surface, it passes freely to the subsoil. If excessive evaporation takes place from the surface, the moisture from below is drawn upward, in a less quantity, it is true, but on much the same principle as in a sponge, with its lower side placed in the water. In its progress upwards, it brings along with it various salts, with which it had become impregnated in the ground, and applies them in solution—the only state in which plants can appropriate them—to the roots. That water does thus pass upward, that it brings up food for plants properly dissolved for their use, and that it does this the more perfectly in proportion as the ground is deeply pulverized, we suppose is not denied. These facts show, not only that long rooted plants are benefited by having an extensively loosened soil, through which to send their runners far and deep after food and moisture, but also that short root plants are benefited by having a deep, well prepared medium through which food and moisture may be brought to them. It is certain that onions, with fibrous roots extending not more, probably, than six inches into the ground, will exhaust the strength of manure, lying at almost any distance below, if the intervening space be occu-

pied by well pulverized earth. The same is probably true of many other plants. It would seem that the rains of heaven percolate the earth, become charged with ingredients adapted to the growth of plants, and then, after the surface moisture has gone off in the air, return to supply its place, bringing with them the various foods of plants, in the only state in which plants can receive them, that is, in solution in water. The conclusion seems irresistible, that plants obtain their nutriment not solely from their immediate vicinity, but from considerable distance below, and that therefore the capabilities of a soil are increased by a deep cultivation. Your committee are of the opinion that if deep cultivation increase the farmer's expenses, it will increase his products more, and thus raise the net profits of agriculture.

Our remarks thus far, we suppose, are applicable to all arable lands. We wish now to make some suggestions with special reference to our deep, alluvial soils. There is in them an almost bottomless reservoir of future food for man and beast, if we can only come at it. By high manuring they have always produced well. By concentrating on a few arable acres the manure of a whole farm, they have been made to produce great crops. Now can they not be made to produce great crops, with only such manuring as consists with the general productiveness of the farm? We think they can; and we believe that deep cultivation is the secret of success. When the Californians have gathered all the gold from the surface they will have to dig under. So with our Connecticut River farmers; they must tap mother earth deeper; and she will pay them back the shining gold for their extra labor. Every dollar judiciously expended in deepening the soils of this beautiful valley, will prove a better investment than the gold digger's passage money and *fixins*.

Hitherto we have wrought the surface only. We have implements for that purpose, and modes of using them, which perhaps approximate perfection as nearly as anything that can be reasonably expected. But if we undertake to do anything more, we may need other tools to do it with. Should we come to the conclusion that eighteen inches of loosened soil

would afford a better pasture for our corn roots than six—enough better to pay the extra expense, and leave an increased profit—how should we effect the change? Not by running deeper with our present ploughs. They are inadequate to the task. Not by constructing them very much larger. No power yet in the field could draw them. Even could we perform the operation, it would bury the vegetable mould in too cold a region, where its decomposition and conversion to food for new plants would be retarded. If performed in the spring, it would leave the surface entirely too cold for the first summer's crop. Trench ploughing, of which so much has been said of late, we suppose is well enough for a rich fancy farmer, who, for the sake of exhibiting his agricultural skill, can very well afford to put more on a few acres than he will take off. It may be well for gardeners in the neighborhood of a large city, where rents are high, manure plenty, and vegetables always in demand; but the practice of it by farmers generally, we apprehend, must be delayed till our country contains at least a hundred millions of people. Subsoiling, in connection with common ploughing, as we understand it, proposes first to invert the top soil some five or six inches, and then to stir the subsoil some ten or twelve inches deeper. For many of our fields this must be a capital operation. We see not how their productiveness could fail to be increased by it. It opens passages for the circulation of air and water. It can hardly fail to produce a favorable influence on the temperature of the soil. But it does not come up to our idea of so pulverizing the soil, that every portion of it may be perforated by rootlets, and become a fit medium for the transmission of water downwards or upwards, as the case may require. We should keep in mind, that, in a well prepared soil, the tendency of water is upward after evaporation, as well as downward after rain.

We have all heard it said, that "it is wise to learn from an enemy." It is wise, also, to learn from an inferior. Presently you will understand what is intended by this last remark. The Spanish farmer, in point of skill, intelligence and industry, cannot be superior to the American farmer. He is indeed more conservative—he uses the same plough to-day that his

ancestors used two thousand years ago. I cannot better describe it than by comparing it with a rake. Imagine for yourself an enormous iron rake, with a long handle and four teeth, long enough to scratch the ground some twenty inches deep, and strong enough to endure the draft of a team. With a leather thong the farmer fastens the end of this to the yoke of a pair of cows or of oxen, as the case may be, and drags it through the field in all directions till those huge teeth, twenty inches long, readily sink into the ground their whole length, and pass freely through it. Now what is the result of this? Why, that he gets fifty bushels of wheat to the acre, once in two or three years, and gets a large crop of roots or some inferior grain, the intervening years, and that with a husbandry vastly inferior to our own in everything except the more careful preparation of the ground before sowing. This refers to the north of Spain, among the Calabrian mountains, where the climate is scarcely superior to our own; and where just about the same process of cropping has been going on for at least fifty generations.

We spoke of learning from an inferior. We are not going to advise you to work cows, as the Spaniard does; nor to send your wives out to drive them, as many Europeans do; nor to substitute the Spanish plough for your own beautiful instrument. The farmer should imitate no one slavishly, but be ready to learn from all, even from the conservatives of the oldest plough in the world. We believe there is many an old field in this region, of rather heavy loam, ploughed for a half a century six inches deep and no more; clay colored, cold and impervious as you descend below the six-inch level; in which if the owner were shut up to the alternative, either of reinverting the old six inches, or of patiently scratching down three times that depth with the Spanish plough, he might better choose the latter; because by so doing, although he should expend more labor in spring, he would get a better return in autumn, and leave his land in a better condition for future crops. But is it not possible that some instrument adapted to produce a like effect on the soil to that of the Spanish plough, but far easier, neater, and more workmanlike in its operation, will yet

be invented? Is it not possible, that by means of it we may yet be able to deepen our soils to any desirable extent, without greatly increasing the expense? It might be a machine resembling the tongue and fore wheels of an ox wagon, with steel bars running down and sloping forward from the axle, so as to penetrate the soil more or less, as they might be guaged, to be drawn by a powerful team through the soil till all should be finely pulverized. Some yankee, we think, will yet invent an implement which, for our alluvial soils, such as are free from stones, will be better than Prouty, Mears & Co.'s best, with the subsoil plough in the bargain.

With regard to established modes of treating the soil, we would not be radicals, nor yet would we be quite as conservative as those who use the oldest plough, unaltered. We would not repudiate old practices till quite sure that we have found better. To farmers we would say, do not adopt on mere recommendation, any theory, however plausible, till you have tried it on a small scale, so small as not to injure you if it do not succeed, or seen it tried, or know that it has been tried, and proved sound. Feel your way by sharp observation and prudent experiments, and before many years we are fully persuaded you will agree with us, that if charity, as the Bible tells us, is casting bread upon the waters, to be found after many days, deep ploughing,—a thorough comminution of the soil,—is casting bread upon the waters, to be found, with increase, after few days.

J. A. NASH, *Chairman.*

Farms.

The pecuniary estimates of the farm have often been put too high, especially when made by professional men, who have no practical experience in farming. There is probably, no class of men who do so much work for so small a pecuniary profit, as the farmer. But is pecuniary profit the main object for which a man lives? Are health, virtue, intelligence and quiet, of no account in the estimate of human happiness? In each and all of these, the farmer must be allowed to have a de-

cided advantage. The unforeseen changes which so often carry confusion and ruin to the mercantile and manufacturing interests scarcely affect him. His subsistence rests on a surer basis, and on the fulfilment of that promise which says that seed time and harvest shall continue to the very end of all things. Is his a toilsome life? That very toil, taken as it is, in the open air and amidst the fragrance of the fields invigorates, his whole nature, and prepares him for that repose which lubricates the joints and strengthens the muscles and prepares him for the labors of the coming day.

It has been asserted by some that the human race is degenerating;—that men do not live so long as formerly;—that they are not so tall and strong as they used to be. There surely must be a reason for this degenerating, and in our humble opinion it is found in the fact, that under the influence of a false refinement, our youth are too eager to quit the farm-houses of their fathers, and crowd into the cities and large towns, with the mistaken notion that such is the surest and shortest road to promotion; they turn away from the pure air of the forest, for the clouds of dust, the continual bustle, the confining employment, the pestiferous influences of the latter. It is in *this* class of people, if in any, that the degeneracy is to be looked for. And it is only by a steady adherence to those pursuits which all past experience declares to be congenial with our physical and moral nature, that the evil can be remedied.

Were we to ask you to look at that condition of life which in our opinion, is preferable to that of every other, we would not take you to the manufactory, amidst the buzz of spindles and the clank of looms; or to the merchant, perched upon his high stool, the live long day looking over his ledger, or to the state officer who is expected to please every body but himself. But we would say to you, just go with us yonder to that house that stands a little from the road, environed by beautiful trees; with a well planned garden in its rear; with lawns spreading out to the right and the left; look at the thrifty herd and the well fed flock, the fruits and the flowers; then enter its comfortable and neat apartments, and on the healthful and intelli-

gent countenances of those who preside there; the beauty and joy that beam in the faces of their children; join with them in their morning song and in their evening hymn; and say, if there be an elysium on earth, you have not now found it.

Four farms were entered for premiums.

E. Pomeroy Cutler's Farm is less than a quarter of a mile from the village of Amherst. It contains thirty-five acres, sloping gently to the west and southwest. It is in the form of a parallelogram, except that it is notched at the south end by two house lots. The soil consists of a fine rich loam, lying chiefly on a hard gravel, and is all arable. The growth of hay the present season, it is believed, is seldom equalled, he having made thirty-two tons and a half from thirteen acres at one mowing; which is two and a half tons to an acre. And this lot for mowing is so conveniently situated, that after the first day, a man will make and get in, a ton in a day, in good weather. He cultivates this year three and a half acres of corn, which is estimated to produce two hundred and fifty bushels. His usual crop of oats is one hundred bushels; and his potato crop ranges from fifty to seventy-five bushels; and he has also a good kitchen garden.

On his farm Mr. Cutler has one hundred and fifty apple trees of the best varieties. Thirty of these have come to an age to be productive. The remainder are but eleven years from the seed. These trees taken together, in point of health, thrift, beauty, and choice selection, probably will not suffer in comparison with the same number within the limits of this society. The committee award to him the first premium of twelve dollars.

Linus Green's Farm is situated in Hadley, more than a mile northeast from the centre of the town. It contains one hundred acres; has a southern exposure with a surface very agreeably diversified with gentle elevations and depressions. On this farm are several springs of pure water, which are not dry in the driest weather, and which must enhance the value of the farm. A very small portion only is not suited to profitable culture. Some parts of it possessed originally a stiff soil and were nearly unproductive of anything valuable. But by a

plentiful application of lime, these parts have been so much ameliorated that they are now among its most valuable portions. It is very judiciously divided into pasturage, tillage and mowing, and supports a very large stock. The products in hay, the present year, are eighty tons, which is of a very good quality; and four hundred bushels of corn and other grains in due proportion. The labor in the warm season, can be performed by about three efficient men. The committee had much pleasure in looking over this farm, not only from its present fine appearance, but also from the consideration that some ten or twelve years ago, it contained little else but deformity and sterility, and owes its present improved state to the indefatigable industry, and the skill of its possessor. They award to Mr. Green, the second premium of eight dollars.

JOHN SANFORD,
In behalf of the Committee.

Fruit Trees.

The committee visited the several orchards of different varieties presented for premiums; and two that were presented for inspection, one by Edward Dickinson, and one by Josiah Ayers, both of Amherst. The orchards of both were set in ground well adapted to their growth, and have since had all the attention that is necessary for their thrift and well balanced tops.

In the orchard of Mr. Dickinson, your committee's attention was called to various kinds of fruit; such as the best varieties of apples, pears, peaches, plums, quinces, and grapes, (both native and foreign,) nearly all of which are in bearing condition. We also saw in his garden a beautiful fig tree loaded with fruit; we were unanimous in the opinion that he has trained them all strictly to the *law* of agriculture. Mr. Ayres has 155 apple trees, all budded on seedling stocks raised from seed of his own planting. He has budded and set them all himself, and has been very particular in every attention required. In

transplantiug seedlings to the nursery, the centre, or tap root of each tree has been cut off for the purpose of giving the lateral roots more vigor. In removing from the nursery to their present position he was careful to dig large places, and subsoiled at least six inches below where they were to stand, supplying a small quantity of compost manure, and set the same depth as when in the nursery. The trees are nearly all thirteen years from the seed, and many of them this year produce fine fruit. This orchard contains almost all the choicest and most approved varieties, of which the owner has the satisfaction to know the name of every individual tree, whether bearing or not. The committee were highly gratified with the success of Mr. Ayer's experiment; and are happy to present this as an illustration of what can be done by skill and intelligence.

We find four apple orchards offered for premiums, viz.: by Alfred Baker, E. Pomeroy Cutler, S. Harrington, all of Amherst, and Levi Boutwell, of Leverett.

We award to Mr. Cutler, first premium, $8; Mr. Baker, second premium, $5.

The committee witnessed with delight, the evidence of taste Mr. Harrington possesses for the cultivation of choice fruit, suited to his soil, and the success which has crowned his efforts. Had the society offered premiums for the best fruit *orchard* containing different varieties, your committee could not have failed unanimously to give the first to him.

There was but one premium offered on pear trees and but one application for the same. Mr. Harrington offered for our inspection, one hundred and eleven pear trees, of different varieties as named in his statement, all of which appear in a very flourishing and thrifty condition. The committee award him the premium of $3.

PAOLI LATHROP, *Chairman.*

E. P. Cutler's Statement.

My orchard consists of one hundred and fifty trees, some of which are in bearing condition, but the majority of them have

never borne any fruit, as they are but twelve or thirteen years old, from the seed. It is all engrafted fruit, and choice varieties, consisting of greenings, pound royals, Baldwins, Newtown pippins, seeknofurthers, Roxbury russets, winter sweet, Hubbardston nonsuch, minister apple, yellow harvest, sops of wine, and some other choice kinds which I cannot find names for. The method of cultivation is to plough the land once in two years, and keep the soil loose and light close to the trees, and manure them with compost manure every fall, have them washed with a solution of potash water the last of May or first of June, one pound of potash to two gallons water; also trim all the small limbs which rub or touch each other. The land on which this orchard stands, is a coarse gravelly loam and not under a very high state of cultivation.

Amherst, *Oct.*, 1851.

Alfred Baker's Statement.

My trees were all engrafted in the nursery, at or near the ground; they were transplanted in the fall of 1838, late in the month of November. The soil in which they were set, was poor, dry, and very stony. My manner of setting them was in the first place to dig a hole sufficiently large to admit the longest roots, and a few inches deeper than I wished to have them stand. Before setting, I threw in a few shovels of rich loam, procured for the purpose, and continued to mix the same with the earth thrown out, in filling up around the trees. They were set from four to six inches deeper than they stood in the nursery. I have kept the land ploughed, taking a crop for the same every year, applying no manure except in the hill when planted and a small quantity from the compost heap around the trees, as often. I have once in a year (with one or two exceptions) washed my trees with weak ley, taken from the leach after making soap, which I think has been of essential service to them. The healthy and thrifty condition of my trees has been particularly noticed by all who have seen them, and I think it a little remarkable that of the 115 or 120 trees set, I have not lost one. My trees stand just two rods distant from each other, which in my opinion is *full* near enough.

Of fruit, I have several varieties; such as greenings, Roxbury, and English russets, Spitzenburg, Congress and seeknofurther; besides some of poorer qualities which I intend to get rid of by engrafting with better varieties.

Amherst, *Oct.*, 1851.

Samuel Harrington's Statement.

I have in my orchard the following trees, viz., of apples—Baldwin 12; greenings 13; Roxbury russets 6; Esopus Spitzenburgs 4; common russets 3; congress apple 4; Philadelphia bell-flower 4; York pippin 4; Miller 2; seeknofurther 3; Peck's pleasant 3; other kinds 29; in all 87. Cherries 20; plums 25; peach 30; quinces 30. Pears—Bartlett on pear stock 25; Bartlett's on quince 12; Flemish beauty 4; Seckel 4; Dix 5; Buffum 3; Bell lucrative 3; St. Ghislain 2; Madaline 4; other kinds 49. Whole number of trees 303.

Amherst, *Oct.*, 1851.

Milch Cows.

The committee, having read the statements and decided according to the best of their judgment as to the comparative excellence of the cows exhibited, are happy to say that, with one exception, they are of a superior quality. The several competitors to whom premiums are awarded, are all of Amherst.

First premium of five dollars, to Spencer Church. His cow is seven years old. She gave forty-five pounds of milk per day during the months of May and June last, from which he made 14 lbs. of butter weekly. Her feed was grass only. She calved April 23, 1851, and her calf is by her side.

Second premium of four dollars, to Rev. John Sanford. His cow is four years old, and has had three calves. Had her last calf on the 20th of last March, which weighed at less than five weeks old 140 pounds. At the best of the season she gave from 14 to 15 quarts of milk a day. Three months from calving, she made 16 pounds of butter in ten days; and in

August, about five months from her calving, she made 14 pounds in ten days; food, grass, with two quarts provender daily. This would give an average of full 15 pounds in ten days for 182 days, which is half a year, and at this rate, 273 pounds in 182 days, and 273 pounds of butter, at one shilling a pound, is $45 50.

Third premium of three dollars, to James P. Dexter. His cow, from the 15th of July to the 24th, (ten days,) gave from 34 to 38 pounds of milk, and made 15 1-2 pounds of butter. During a period in September, of ten days, her average quantity of milk was 34 pounds, from which he made 14 pounds of butter. Her feed was grass, with two quarts of provender daily. The cow calved the 4th of March, and the calf was of a good quality.

Fourth premium of two dollars, to H. L. Burnham. The milk of his cow, from October 1st to 21st, was five quarts per day; very yellow and sweet. Used one quart per day in the family. The butter made in that time was nine ounces per day, the cow had only pasture feed. She calved on the 1st of August, 1850.

A cow was entered by Alvan Barnard, of Amherst, and by his statement, (that she yielded 113 12-16 pounds of milk in three days, ending October 18th, from which he churned 5 12-16 pounds of butter, appears to be a very valuable animal, and would have been entitled to a high premium had the conditions of the society been complied with on his part. We recommend to him a gratuity of $1 00.

We see occasionally a cow that produces 14 pounds of butter in a week, but how seldom! Now the question arises, how can we breed good cows? In all animals, as well as vegetables, like produces like. But here there seems to be a great uncertainty. A good cow, perhaps the most useful among domestic animals, and what every family needs, *seems* to come by chance. If a man happens to have a good cow, it is no doubt very agreeable to take a prize; but he has done nothing to make her what she is, and he is not certain of rearing another like her.

If there is a breed of cattle in the world that can be relied

on as producing superior milkers, pray let us have them, that we may not be disappointed and discouraged when we undertake to raise at considerable expense, a good heifer from a good cow. What we stand very much in need of, in this as in other matters relating to agriculture, is that most highly esteemed commodity, *science.*

The Ayrshire stock have been much extolled for their milking properties. The Hampshire, Hampden and Franklin Agricultural Society, was presented with a sire of this breed nearly three years since, by the Massachusetts Society, but where is the man who is rearing an individual heifer from him, with full confidence that she will make a first rate cow? So weak is our faith in this matter, that even this animal, imported at great expense, and his dam probably from some of the best milkers in Scotland, has been lightly esteemed by some of the leading members of that society; and a few months since, it was deemed inexpedient longer to give him a support. He is, however, still in their possession at Hadley, and your committee would strongly urge upon all who may obtain calves by him, the importance of giving the stock a fair trial, hoping that a decided improvement in our breed of milkers may be the result.

THEOPHILUS P. HUNTINGTON, *Chairman.*

Steers.

The committee say that the two years' old, were a superior lot, all fair and some very fine. The weight of four pairs was as follows; the first weighed 2600 pounds; the second 2470 pounds; the third 2390 pounds; the fourth 2400 pounds.

Fat Cattle.

The committee (Levi Stockbridge, chairman,) say that the business of fattening cattle is important and extensive in this

county. Our farmers feed out their hay and grain, and return their fertilizing properties to their farms. We speak advisedly when we say that at least one hundred and twenty-five thousand dollars' worth of beef are annually fattened within the limits of the society.

Butter and Cheese.

Twenty-two specimens of butter, of fine appearance and of superior quality, contributed largely to the exhibition in Sweetser's Hall.

The statements of the process of making butter, might have been more full, and therefore much more valuable. The entire method may be familiar to housewives, yet it is not probably uniform. The best mode is to be ascertained by comparison of statements, the publication of which will put them within the cognizance of every farmer's wife and daughter.

The *manner of milking* has much to do with the quantity of butter produced. Let the cow's bag be thoroughly exhausted of milk; for it is believed, that *one pint at the close of milking will make as much butter, as four pints, at the commencement.*

The most suitable place for the milk, while the cream rises; the proper time for this operation; the right depth of the pans; whether the cream, after it is skimmed, should be put in buckets or in pans; in the well, or in the cellar, or in a cool vault constructed under the cellar floor, are matters of importance.

It is desirable, that the degree of temperature of the cream, during the churning process, and that the form of churn—which produces the best quality and largest quantity of butter—be ascertained, and generally adopted.

After the butter comes, the most delicate part of the process remains, the removal of all particles of the buttermilk. It is suggested, that our dairy-women could afford to apply here double their usual labor to half the quantity of butter; for this half would be worth more, for the table or for the market, than the whole in the condition it is usually prepared. The removal of buttermilk is effected by some, with the use of water; by

others, without water; and by others, with sweet milk. Which is preferable? Experiments will furnish the most satisfactory answer, and the statements, accompanying the butter at the annual cattle show, will disclose it to the agricultural community.

The salting process is of no small consequence. "To salt to suit the taste," or with half, or three fourths of an ounce of salt or more to the pound, are some of the methods. So various are the rules of good housewives, that we can easily account for all the differences, in the quality of their butter.

Notwithstanding the utmost skill in the process of butter-making—from the milking of the cow to the moulding of the yellow lumps for the table or for the market—it will be found that one quart of milk from some cows will yield as much or more butter, than two quarts from others. The cow that yields the greatest quantity of milk, may not yield so good a quality of milk for butter, as another. Hence, it is for the interest of the farmer, who is about to purchase cows for their butter-making qualities, to test their milk. And here it may be proper to state, that although the breed imported from the county of Ayr, in Scotland, is celebrated for great milkers; yet, the most productive cow in butter, found in England, by the late Mr. Colman, was a *North Devon;* she made 21 pounds of butter per week, for several successive weeks, without extra feed. *An imported bull and cow of the North Devon breed*, are in possession of this society, at the residence of the president, for the convenience of the farmers of this region.

Sixteen parcels excellent cheese were presented for inspection. The statements are satisfactory, although they might have been more extended. May the day soon arrive, when our dairies shall become to old Massachusets, all that the dairies of New York are to the "Empire State." The average annual product, in 1846, of the dairies of Herkimer county, ranged from 500 to 650 pounds of cheese per cow. A Mr. Rottier, of Jefferson county, N. Y., in 1849, produced from 26 cows an average, of from 125 to 150 pounds of butter, and from 300 to 400 pounds of cheese, per cow.

When the farmers of the Connecticut valley *will* to have such products, with the blessing of God, *they will come.*

For the committee,

J. W. BOYDEN.

Mrs. Wm. Merrick's Statement.

I herewith present for inspection a sample of six cheeses from a dairy of eleven cows. Process of making. The night's milk is strained into a tub; to which is added the morning's milk. After having taken from the night's milk about two gallons, turn in the cream and place it in a kettle of scalding water. When heated to a temperature of about 90 degrees, add rennet sufficient to bring the cheese in about an hour; when wheyed off, press about two days, and turn daily till cured.

Mrs. Oren Williams's Statement.

The milk, when taken from the cow at night, is permitted to stand in a tub for that purpose, until the next morning. Then the cream is taken from it, and warmed with a quantity of milk; then it is turned back with the morning's milk, and rennet is added to it, after which it is to stand until the curd separates from the whey. It is then scalded, dipped off, permitted to drain until afternoon, and then manufactured into cheese.

BERKSHIRE AGRICULTURAL SOCIETY.

The forty-first anniversary of this society was held at Pittsfield, on the 1st and 2d of October last. The address was delivered by the Hon. Marshall P. Wilder, of Dorchester.

Agricultural Products.

The committee, in the performance of their duty, have had occasion to notice the agricultural interests of Berkshire, and it is a source of pride and pleasure that they are enabled to report her rapidly advancing. As an agricultural district she is regarded as second to none, and in contrast with her sister counties, soon may be seen (if she is not already) leading the van.

The wonderful changes which have been effected in the appearance of many portions of our county within a few years, are indeed highly commendable. Waste and broken lands, before entirely unproductive and considered worthless, have been, by judicious management, reclaimed, and now comprise some of our fairest meadows, yielding a rich annual tribute. Exhausted lands have, by the application of science and good husbandry been renovated, and now fields of rich grain are seen upon lands which a few years ago were supposed to be beyond the hope of recovery. Many new and beautiful dwellings with neatly ornamented grounds, richly displaying taste and refinement; barns and other buildings of superior plan and structure, stored with the bountiful harvest which the present season has furnished; all have attracted the attention of, and been surveyed with great pleasure by your committee.

Indeed, in all portions of our county indications of the spirit of improvement were observed, not only in agriculture but horticulture. Some beautiful gardens of flowers, fruits and

vegetables were shown your committee, all of which deserve the highest praise. We are happy to see such evidences of a growing taste for the cultivation of the different varieties of fruits; the apple, pear, peach, plum, apricot, and grape, and a variety of other fruit, to all of which our soil and climate are so admirably adapted, and would cheerfully recommend a more extensive cultivation of the same.

In conclusion, your committee would take occasion to say, that they have everywhere been made the recipients of that kind hospitality so characteristic of the good people of Berkshire.

The number of entries for premium was 220, a number far exceeding that of any former year, all of which have been examined with great pleasure and satisfaction. Your committee would be pleased to give to each and all a premium, which they so much merit, but our means are limited, and we award as follows:—

WINTER WHEAT.

For the best acre of winter wheat, James Baldwin, Egremont,	$6 00
For the second best do., Leonard Tuttle, Sheffield,	4 00

SPRING WHEAT.

For the best acre of spring wheat, Reed Mills, Williamstown,	6 00
For the second best do., Harvey Chapin, Sheffield,	5 00
For the third best do., Caleb Brown, Williamstown,	4 00
For the fourth best do., Solomon Russell, Pittsfield,	3 00
For the fifth best do., Darius Ford, Lenox,	2 00

WINTER RYE.

For the best acre of winter rye, Norman Wilcox, Stockbridge,	6 00
For the second best do., Joseph H. Chapin, Sheffield,	5 00
For the third best do., Edmund Bush, Sheffield,	4 00
For the fourth best do., Chester K. Lanphire, Lee,	3 00
For the fifth best do., Enos Smith, Stockbridge,	2 00

CORN.

For the best field of corn, not less than three acres, Henry Smith, Lee, - - - - - $6 00
For the second best do., E. C. Carter, Stockbridge, - 5 00
For the third best do., Clement Harrison, Adams, - 4 00

CORN.

For the best acre of corn, Edson P. Sexton, Stockbridge, 5 00
For the second best do., Benjamin Parsons, Lenox, - 4 00
For the third best do., Ezekiel R. Colt, Pittsfield, - 3 00
For the fourth best do., James S. Smith, Lenox, - 2 00

OATS.

For the best acre of oats, William E. Johnson, Williamstown, - - - - - - 5 00
For the second best do., William Daily, Sheffield, - 4 00
For the third best do., Albert G. Belden, Lenox, - 3 00
For the fourth best do., John S. Noble, Pittsfield, - 2 00

MESLINGS.

For the best acre of meslings, Albion P. Bagg, Lanesborough, - - - - - - 5 00
For the second do., Marshall Butler, Lenox, - - 4 00
For the third best do., Jonathan Andrews, Richmond, - 3 00
For the fourth best do., Stoddard Hubbell, Lanesborough, 2 00

BARLEY.

For the best acre of barley, Morgan Lewis, West Stockbridge, - - - - - - 5 00
For the second best do., B. F. Mills, Williamstown, - 4 00
For the third best do., Seymour T. Cooman, Pittsfield, 3 00
For the fourth best do., Marshall Brace, Stockbridge, - 2 00

BUCKWHEAT.

For the best acre of buckwheat, Robert E. Galpin, Stockbridge, - - - - - - 4 00
For the second best do., George S. Willis, Pittsfield, - 3 00
For the third best do., James Meacham, Williamstown, 2 00

The peas brought to the notice of your committee, were not of such a character as in their opinion merit premium.

POTATOES.

For the best acre of potatoes, Charles E. Hinckley, Lee, - - - - - - $5 00
For the second best do., J. R. Lawton, Great Barrington, 4 00
For the third best do., Elias Wright, Monterey, - 3 00
For the fourth best do., A. Shephardson, Lanesborough, 2 00

CARROTS.

For the best ¼ acre of carrots, Elijah N. Hubbard, Great Barrington, - - - - - - 3 00
For the second best do., Benjamin Hull, Stockbridge, - 2 00

GRAFTED APPLE ORCHARD.

For the best grafted apple orchard, Asahel Foot, Williamstown, - - - - - - 12 00
For the second best do., George S. Willis, Pittsfield, - 10 00
For the third best do., Edson Sexton, Stockbridge, - 8 00

M. SEARS, *Chairman.*

Reed Mills' Statement.

I hereby transmit to you the process of cultivation and fertilizers used the present and last year on a field of spring wheat, which obtained the first premium at the late fair in Pittsfield, not, however, with the idea that this is the best mode, but rather with the view that we may hear from other wheat growers in Berkshire, who have had more experience, and whose products have been not only twenty-eight and three-fourths bushels per acre, the quantity we had, but thirty-eight or forty bushels per acre, which, I believe, can be raised. Yes, there are many hundred acres of land in old Berkshire capable of producing, with the right cultivation and fertilizers adapted to its growth, forty bushels to the acre; if so, why may not every farmer in Berkshire, be his farm ever so small, if it contains one acre, raise his own bread stuffs? How many

thousands of dollars are paid annually by the inhabitants of Berkshire for bread stuffs for home consumption, when, at the same time, more than ten times the amount lays within eight inches of the surface of the earth, and what we want, is to know the surest way to draw it out.

Our field last year was planted to corn, thoroughly manured and plastered. Early ploughed this last spring and subsoiled, one bushel and three pecks of seed to the acre, harrowed in. When the blade was up two or three inches, we went over the entire field once in a place, with a light harrow, followed with a roller. This process is most valuable if performed just before a rain. I am sensible it helped our grain, but whether it would be good for all kinds of soils is a question I cannot answer. About the time we harrowed, we applied a light coat of plaster. If the crop the previous year was hurt with worms, I would add one peck of salt to three pecks of plaster, and mix before sowing.

Our seed was obtained from abroad, in which item there is a greater gain than most farmers are aware. Our kind was the Mediterranean, weighing sixty-one and one-fourth pounds to the bushel.

South Williamstown, *Oct.* 20, 1851.

Ploughing Match.

Peace hath its victories as well as war; it was a sun as bright as Austerlitz that broke upon the field of contest, but the mists which it dispelled were not the murky clouds that hover "dreadfully over death's alembic," but the feathery mists that had been all night long creeping up from the Housatonic, to paint with a thousand rainbow tints the oak and the maple leaf. In the midst of a wide panorama of hills and mountains, the yeomanry of our dear Berkshire, gathered, not to beat back from its soil the footsteps of a tyrant and an invader, but to reveal from the long drawn furrow, the hidden wealth which Mother Earth holds in her bosom; a wealth more precious than the sands which glitter on the banks of the Sacramento. The

generous emulation of industry—the face smiling in its enthusiasm—the eye lit up with the sparkle of eager and honorable effort—the swarthy arm of free labor bared to the full development of the light and straining muscles—the encouraging cheer and halloo to the cattle, half sensible of the holiday strife of their owners—all were on the field developing the triumphs of the farmer, and illustrating the kindness of that Providence, which softened the curse of earth's first farmer, by attaching to "labor's brow-bedewed toil," the surest elements of independence and happiness.

Nature is a kind friend, earth is a gentle mother. She gathers her children about her in the autumn; and as Providence, after the waste of a deluge, pointed to a rainbow in the sky as the pledge and a promise of hope, so kind earth bids her children here look out upon the rainbows which are interlaced upon the mountain side, and the many tints of the ripened harvest, as the pledge and the witness of hope's realization, and labor's generous reward. The strife of the ploughmen went on—the damp furrows browned in the October sun—mothers and sisters and daughters smiled upon the skill of sons and brothers—music sent up its mellow voice—the birds which had lingered from their southern tour to sing their farewell concert at the farmer's jubilee, joined their melody to shrill fife and soul-stirring trumpet—the goal was reached, and the sward which so late had been gleaming with dew-drops, was prepared for the tasseled corn of another harvest.

The triumphs of honest industry are the best, perhaps the only real triumphs of ambition. The furrows which the politician ploughs, are either too wide or too shallow, or his work is not performed in the time which is marked out for him at the commencement of his career. His eager strife wins few laurels, and no valuable harvest rewards the heart-burnings and toil of seed-time. The angry tide of speculation wastes itself upon the sands, or wrecks the bark it bears on its crest, upon beetling cliffs. But the ploughman knows when he turns the furrow, that the sun of another summer will swell the seed which he casts there, and that a kind Providence hovers above him, with the blessed promise, "seed time and harvest shall not fail."

The work was well performed. Every year witnesses new improvements in the ploughs, and greater excellence in the ploughmen. Your committee have had no little difficulty in allotting the prizes to the different competitors. And with fear and trembling, only consoled by honest intentions, they award them. There were seventeen horse teams, and seven ox teams on the field.

CHARLES N. EMERSON, *Chairman.*

Milch Cows.

The number of competitors in this class was quite respectable, although it might have been much diminished by the regulations adopted by the society, for testing the merits of the animals. The competitors were required to furnish a statement setting forth the time of calving, the number of pounds of milk produced in the third week of June and the third week of September, respectively, the number of pounds of butter made from the same, and what feed was given beside pasture, and how much. The first cow upon which we report, was offered by George S. Willis, of Pittsfield, who complied with the conditions required, and whom we award the first premium of ten dollars. This cow produced from the 18th day of June to the 24th, inclusive, seven days, three hundred and fifteen pounds milk, averaging forty-five pounds per day, and making sixteen and seven-eighths pounds of butter, and seven days in September, two hundred and sixty-six pounds of milk, and fourteen and one-eighth pounds of butter.

The second was presented by Walter Tracy, of Pittsfield, who did not strictly comply with the society's regulations, to whom we award the second premium of nine dollars. The cow produced thirty pounds of butter in two weeks, in the month of June.

The third premium we award to James Sears, of Pittsfield, for a beautiful three-years old heifer, eight dollars.

The fourth premium, to James H. Roberts, of Hinsdale, seven dollars, for his Durham cow. This cow produced three hun-

dred and thirty-nine pounds of milk the third week in June, making fifteen and nine-fifteenths pounds of butter.

The fifth premium, to Walter Richards, of Lenox, six dollars. This cow furnished the third week in June, three hundred and eight pounds of milk, making fourteen and seven-sixteenths pounds of butter.

The sixth premium, to George W. Goodrich, of Pittsfield, five dollars.

NELSON STRONG, *Chairman.*

Sheep.

All of the lots of sheep examined, gave strong evidence that there is an improvement going on in the county; but the committee see ample "verge and scope" for greater excellence. They are of opinion that there ought to be a greater improvement in the weight of fleece. The probable average amount produced in this county, for the last ten years, does not exceed three pounds to the fleece, which is far below what it ought to be, to make the growing of wool a profitable business, in view of the price which has been realized for it. That it is as easy to produce four or five, six or seven pounds of fine and pure wool to the fleece, does not, in our opinion, admit of a doubt; provided there is proper attention paid to the matter.

In making this improvement, it is not recommended that it be done wholly by increasing the size of sheep, but that there be a greater per cent. of wool from sheep of the present size. No wool grower ought to be satisfied with his improvement, unless his flock yields one pound of fine pure wool to every ten or twelve pounds of carcass. It may be thought that this calculation is beyond what can be effected, but it is fair to suppose that what *has been done*, can be done again, and what one man can do, can also be done by another. We have it from good authority, that the flock of A. L. Bingham, of Vermont, produces a yield of one pound of wool to every seven or eight pounds of carcass.

EDWARD CHEESMAN, *Chairman.*

Fruit.

The committee report that their's was a pleasant service, thus to look upon the treasures of Pomona, which she had dropped in such rich and beautiful varieties, into the paths of those who had *labored* to secure her smiles; although the number of varieties was not so great, nor the entries so many as we have sometimes seen, yet there was enough to convince the most faithless, that Berkshire hills and Berkshire vales are places, over which the goddess of fine fruits would like to extend her luxurious and health-giving favors. Indeed, we question whether any locality can furnish better specimens of the Baldwin, the Northern Spy, the Greening in its varieties, together with other kinds of apples desirable for cultivation, than those which have graced this and other exhibitions in the county this season. It is an agreeable fact to communicate for the encouragement of all who would plant a fruit tree, and gather its choice products as the results of their own happy labor, that these contributions have come in from almost every section of the county. So then, we fairly infer what may be done among us in the way of fruit-growing, if the people are only disposed to do it; yet we would by no means insinuate that orchards can be planted and grown without toil and care. It is a wise arrangement, that all that is valuable for us to attain, is the result of both these, and the labor and care of successfully cultivating a tree, is probably much less in proportion to the profit or the comfort it will eventually give, than that bestowed upon a field of corn or a flock of sheep. These last, to be sure, may yield more speedy returns for the labor invested, yet who can suppose that for a series of years they will give a tithe of the per centage that a choice orchard will yield? So long as choice apples and pears sustain their present prices, and there is no fear of diminution, there is, we are certain, no business more *profitable* than their cultivation. An orchard may be three or four, five or six years in coming into bearing, from the time the trees are taken from the nursery, according to the care and labor bestowed; but when its productiveness commences, back expenses are soon paid, and all is profit beyond.

We award on winter apples,

The first premium, to	Edward C. Carter, Stockbridge,	$3	00
Second "	Joseph Stevens, Sheffield,	2	00
Third "	Luther S. Butler, Lenox,	1	00

On fall apples,

First premium, to	David F. Goodrich, Stockbridge,	$2	00
Second "	Luther Sears, Jr., Lenox,	1	00

And recommend a reserved premium of one dollar, to Nathaniel Cook, of Richmond, for a choice lot of winter apples.

Six seedling varieties of apples, many of them from trees supposed to have been planted by the Indians, were presented by Samuel Goodrich, of Stockbridge. If the taste of these apples is to be relied upon as evidence of their excellence, they are well worthy of cultivation, as they are certainly adapted to the soil and climate of Berkshire. Also, beautiful seedling plums, by W. Curtis, of Lenox.

Twenty-five or thirty varieties of winter apples were presented for exhibition, by Benjamin V. French, of Braintree, and fifty-two varieties of the pear, by M. P. Wilder, of Dorchester.

WILLIAM BACON, *Chairman.*

Household Manufactures.

A premium of two dollars was awarded to Mrs. John Osborn, of Pittsfield, for some beautiful linen thread, spun in her 84th year. The committee (J. C. Hoadley, chairman,) say, there is about a pound of this thread, and every skein of it should be kept as a precious heirloom in the family of the venerable lady who spun it. The "little wheel," as the machine for spinning flax was called, which used to blend its tiny murmur with the loud hum of the "great wheel," on which hand-carded rolls were spun into woollen yarn, has shared the fate of its more pretending sister,—the merry music of both is drowned in the din of the factory. This little linen thread runs back into the time, when our grandmothers sat, with foot

on treadle, twirling the shining black spokes of the little wheel, and with busy fingers dipped ever and anon into water contained in a gourd, teased the flaxen fibres from the distaff; while the sturdy matron or the buxom maiden danced a lively measure beside the spinning wheel, transferring, with nicest art, the fleecy rolls to the fast filling spindle. Modern manufacturing may have its compensations, but these scenes of cheerful domestic industry will ever remain among the happiest recollections of our youth.

HOUSATONIC AGRICULTURAL SOCIETY.

The annual cattle show and fair of this society were held at Great Barrington, on Wednesday and Thursday, 24th and 25th of September last. The exhibition of agricultural products was large, and the great number and excellent quality of grain crops presented for premiums, indicate that our farmers are successfully giving more attention than heretofore to the cultivation of these crops. The display of potatoes was very fine. One specimen was presented, which was raised from seed of four years' growth, and which had been entirely free from the rot, while others grown in the same field have been more or less affected every year. The exhibition of stock was not as large as last year, although decidedly good. Products of the dairy, of the spinning wheel and loom, and of the garden, were in profusion and of the finest quality.

The hall of the new centre schoolhouse was devoted to the exhibition of fruit and flowers. There was a large variety of choice fruits exhibited, though the yield of some varieties is this year quite limited in most parts of southern Berkshire. An increased attention is devoted by our people to the cultivation of choice fruit.

The ploughing match on Thursday morning, was one of the most important features of the occasion, and the grandest spectacle of the kind we ever witnessed. A beautiful September sun looking out from a cloudless sky upon our beautiful valley and autumnal-robed hills, the bracing air of the morning and the excitement among the friends of the respective competitors, gave unusual life and interest to the scene. The grounds were surrounded with spectators, to the number of five thousand, in carriages and on foot. Twelve horse teams and five ox teams were entered for the prizes, and were accompanied, during their movements, by the stirring notes of a band of music.

After the ploughing was completed, the annual address before the society was delivered by Marshall Warner, of Stockbridge.

A close attendance upon the proceedings of the fair that has just passed, has more than ever convinced us of the useful influence which agricultural societies and their annual holidays have upon the community. We have seen the hardy yeomanry of our county, the mechanic, the professional man, and last, though not least, the fair daughters of Berkshire, come together, with smiling faces and hearts full of welcome for each other, for the purpose, though incited to a certain extent by a laudable spirit of rivalry, of laying their offerings of real and substantial products upon the altar of public good. We have seen many classes and branches of industry here represented in one common gathering.—have seen the toiling sons and daughters of southern Berkshire mingle together in the enjoyment of their annual holiday, incited by a spirit of enterprise and good will, which cannot fail to operate for lasting good upon the hearts of our whole people.

Agricultural Products.

The committee were invited to examine and report upon one hundred and eighty growing and ripened crops, and eight gardens, there being in all not far from one hundred competitors for the premiums to be awarded by the society. Of winter wheat there were fifteen entries and of spring wheat, ten; nearly all of these crops were good, giving promise of abundant returns for the labor bestowed. On winter rye there were thirty-two claimants for premiums. Rare indeed is it to see this crop so universally abundant and extending over so large a portion of our county. It is not to be expected that the committee could see with the eyes of the claimants, yet they have earnestly endeavored to award the premiums as justly as it was in their power to do. Competitors should ever bear in mind that to bestow premiums for the most successful efforts, is but a small part of the object of the society,

which is mainly to elicit and disseminate agricultural information.

The applicants for premiums on oats numbered forty-six, the like crop of which was never seen in Berkshire, and, as your committee believe, seldom in New England or anywhere else. Fields varying from fifteen to fifty acres, many of which were judged to yield from sixty to ninety bushels to the acre, came under the observation of the committee, and they have availed themselves of every spare dollar, placed at their disposal, for a bounty on this crop.

The crop of Indian corn, owing in some measure to the coldness of the season, may be characterized as in a backward state and the ears not as well filled as usual, although some large crops were brought to our notice. But few fields were found well ripened, yet there were forty-seven entered for premiums and but seven premiums to bestow. Here pause we a moment to make a remark, which we consider of great importance to the growers of Indian corn. Almost everywhere in southern Berkshire, we found a great growth of stalk, in comparison with the size of ear. Indeed we saw but one field to which this remark would not apply :—If our brother farmers would but take the trouble to procure good seed corn from the north part of the county, they would be greatly benefited thereby.

Thirteen entries were made for potatoes, of which the crop is, in the main, very sound, and in size, quality and yield, reminds us of the abundant crops gathered in former years.

In a former part of this report we have said, that the more important objects of the society is not the bestowal of premiums, but to elicit and diffuse agricultural information, and to arouse and spread abroad the spirit of improvement. And that spirit, we are most happy to say, is aroused and is encompassing the whole length and breadth of our borders. We see it in every valley and on every hill. Our waste places are being brought under the hand of cultivation, commodious houses and barns are in process of erection, and the motto of the Berkshire husbandmen is still "excelsior."

The committee award as follows :

For the best acre of winter wheat, to James Baldwin, of Egremont, - - - - - $6 00
Second best, to John H. Lawton, Gt. Barrington, - 5 00
Third best, to John L. Cooper, Sheffield, - - 3 00
For the best acre of spring wheat, to Allen S. Yale, Stockbridge, - - - - - 6 00
Second best, to Benjamin Wheeler, New Marlboro', - 5 00
Third best, to J. W. Parks, Sheffield, - - 3 00
For the best acre of winter rye, to Norman Wilcox, Stockbridge, - - - - - 6 00
Second best, to Joseph Chapin, Sheffield, - - 5 00
Third best, to Edmund Bush, Sheffield, - - 4 00
Fourth best, to Joseph Gibson, Gt. Barrington, - 3 00
Fifth best, to David Pratt, Sheffield, - - 2 00
For the best acre of corn, to Nelson Joyner, Egremont, 7 00
Second best, to Hiram Kirby, Sheffield, - - 6 00
Third best, to Joshua R. Lawton, Gt. Barrington, - 5 00
Fourth best, to Leonard Tuttle, Sheffield, - - 4 00
Fifth best, to Edson Sexton, Stockbridge - - 3 00
Sixth best, to Thomas Wood, Egremont, - - 2 00
For the best four acres of corn in one piece, to Henry Smith, of Lee, - - - - - 10 00
For the best acre of oats, to William Daily, Sheffield, - 6 00
Second best, to Edmund Joyner, Egremont, - 5 00
Third best, to Washington J. Bissell, Gt. Barrington, 4 00
Fourth best, to Robert B. Brown, Egremont, - 3 00
Fifth best, to Stephen Powell, New Marlborough, - 2 00
For the best acre of barley, to Marshall Brace, of Stockbridge, - - - - - 3 00
Second best, to Morgan Lewis, West Stockbridge, - 2 00

EGBERT B. GARFIELD,
R. E. GALPIN,
JOSEPH WILCOX,
Committee.

Agricultural Implements.

Agriculture is so much dependent upon the mechanic arts, that it can never attain its highest triumphs until the inventive genius of our mechanics shall seek an appropriate field for the display of its powers, in future improvements upon the construction of the implements of husbandry.

Among those shown at the fair, was a fanning mill to clean grain and seed, manufactured by Martin Rees, of West Stockbridge. It is on a new principle, simple and easy to be kept in repair, and does the work with great rapidity. After witnessing its operation, the committee came to the conclusion that they had seen nothing better.

They were also shown some superior forks, manufactured by William K. Gates, of Lee. There are few agricultural implements that have received more improvement within forty years than the fork. The old forks that were then in use, would now almost be considered a load for a man, while those manufactured by Mr. Gates are sought after for the pleasure of using them.

A. GIDDINGS, *Chairman.*

Ploughing Match.

The ploughing match, if we are to judge from the thousands assembled to witness this delightful and exciting scene, is the main attraction of this, the great holiday of southern Berkshire.

The land selected for this interesting trial, was again on the beautiful meadow owned by Benjamin Coles. The land was marked out into quarter acre sections, each twenty rods long by two rods wide. The time allowed for doing the work was one hour, including a rest of ten minutes after the first twenty-five minutes. The furrow to be not more than twelve inches wide, and in depth not less than six inches. The whole number of competitors entered was 17,—horse teams, 12; ox teams, 5.

HORSE TEAMS.

First premium, to Elijah N. Hubbard, Gt. Barrington,	$7 00
Second premium, to Horatio N. Tuttle, Sheffield,	6 00
Third premium, to Pliny Karner, Jr., Egremont,	5 00
Fourth premium, to Nelson Joyner, Egremont,	4 00
Fifth premium, to J. R. Lawton, Gt. Barrington,	3 00
Sixth premium, to Loomis Millard, Egremont,	2 00
Seventh premium, to Charles S. Joyner, Egremont,	1 00

OX TEAMS.

First premium, to Moses P. Lawton, Egremont,	7 00
Second premium, to George Burghardt, Gt. Barrington,	6 00
Third premium, to Leonard Tuttle, Sheffield,	5 00
Fourth premium, to Lorenzo H. Rice, Gt. Barrington,	4 00

SAMUEL H. BUSHNELL, *Chairman.*

NORFOLK AGRICULTURAL SOCIETY.

The exhibition of this society was held at Dedham, on the 24th of last September. In consequence of the unfavorable state of the weather the preceding day and evening, it was not so extensive in some of its departments as was anticipated. A storm, accompanied with violent gales, continued during most of the night, threatening to prostrate the great tent which had been erected for the occasion, and to demolish the other preparations which had been made. Contrary to all expectations, about dawn the weather became fair, and seldom have we seen a more propitious day for such an exhibition. The pelting storm had spent its fury, the rushing wind had retired to its hiding-place, and the morning broke upon us with that clear sky and glorious sunshine which distinguish the most delightful days of a New England autumn.

The large attendance, the number, variety and excellence of the contributions, under such circumstances, were peculiarly gratifying and encouraging. Not less than ten thousand persons were present, and the number, by some, was estimated much higher.

The "Ploughing Match," as usual, was a scene of great interest, and was witnessed by a great concourse of people. There were nineteen teams which entered the list for competition, and seldom did the Athletæ in the Greek games contend with more zeal for the palm of victory, than these sons of Norfolk for the prizes. The results of the contest showed that success did not attend the man who made the most noise, or the most frequent use of his whip.

In the department of stock, there were several fine native and grade animals, but the distinguishing feature was the large proportion of pure blood-cattle on exhibition; among others, especially those recently imported by the Massachusetts Society for the Promotion of Agriculture, which has labored so long for

the improvement of our breed of cattle. No object is more worthy of effort, or of more importance to the farmer. We are happy to state, that on this subject a new interest has been awakened among our members, and that its influence is already to be seen in the improved character of our stock. We cannot expect any rapid advance, few farmers being willing to incur the great expense necessary to possess the finest breeds; but from the improvements which have already taken place, and from the zeal and enterprise manifested by many of our farmers, it may be reasonable to anticipate, that the Norfolk society in the line of *blood stock* will not be surpassed by her sister associations.

The exhibition of swine, was, as heretofore, of a high character, many of the animals being of rare excellence, especially those of the Suffolk breed, so universally admired by all.

But little attention has hitherto been given to the breeding and raising of horses in this county, the many fine animals possessed by our citizens having generally been brought from other states. We are happy to learn, however, from our exhibitions, and from other sources, that efforts are in progress for the improvement of this useful and noble beast.

In poultry, the exhibition was, as on former occasions, very extensive, containing most of the new and popular varieties in the country, and adding greatly to the interest and utility of the show. The report of the committee on this subject, forms a valuable part of these transactions.

In the products of the dairy, the exhibition was, as usual, very small, on account of the proximity of our county to Boston market, and the sale of its milk in that city, and in other places. The sale of milk may be more profitable than the manufacture of butter and cheese; still, it is to be regretted that more attention is not devoted to the production of these articles. We especially commend the worthy example of contributors during the present and past seasons.

The pomological department is always an attractive and important feature of our exhibitions. This county has been long and justly celebrated for the cultivation of fruits. A spirit of enterprise and emulation has existed for many years among her

citizens. Almost all the native or foreign varieties of the pear and other fruits, have been added to our collections, for the purpose of testing their excellence and adaptation to this location and climate. Much attention has recently been paid to the planting of orchards, especially the peach. This crop has hitherto been considered too uncertain for profit, but the experience of the past few years has corrected this erroneous opinion and increased its cultivation.

The exhibition of agricultural implements was smaller than was anticipated. While this was regretted, the society were highly gratified with the ploughs manufactured by their members, Messrs. Prouty & Mears, and especially with the prize plough which received the *first* premium at the general competition of the world's fair. From the same manufactory was exhibited the Michigan sod and subsoil plough, noticed in the transactions of last year, the work of which on the field, bore additional testimony to its utility, and was deemed by the society worthy of a special gratuity. This plough is constructed with two shares, the one in advance, raising a sod of three or four inches in depth, the other, following and covering it with about the same depth of the lower soil. By this process, the vegetable nutrition which is turned under with the sod, is prevented from escaping during decomposition, and the inorganic substances which are brought up in the subsoil, exposed to the beneficial influences of the atmosphere. For the turning in of grass or stubble, this implement is considered as one of the most important which has recently come to notice. The address was delivered by George R. Russell, LL. D., of Roxbury.

The society during the past season has purchased a lot of land in Dedham for its future exhibitions. Upon these premises, there have been constructed one hundred and twenty pens for domestic animals. A never-failing well of excellent water has been dug, and the whole enclosed by a substantial fence.

The funds of the association have not been much increased. An accumulation was confidently anticipated, but the destruction by fire of its cattle pens, lumber and furniture, occasioned a loss of about six hundred dollars, which it became necessary to replace, and to which may also be added, as extra expenses,

those incident upon fitting up its new location. With the present arrangments, and with the plan of taking a fee of admission at the gates, and of continuing the show for two days, the society expect to be able hereafter, not only to defray its annual expenses, but to add something to its permanent fund.

Never before has so strong a desire existed among our yeomanry for knowledge in rural labor, especially in relation to the proper adaptation of soils, manures and crops, the breeding and raising of stock, and the most recent improvements in the arts of cultivation, and the implements of husbandry. A favorable change has taken place in the minds of our farmers, in relation to scientific investigation. A spirit of inquiry has been aroused, and they are not only anxious to avail themselves of the best practical experience, but to become acquainted with the natural laws and principles upon which depends the full development of their agricultural resources.

In conclusion, the undersigned cannot refrain from expressing the belief, that the exhibitions of agricultural societies, and the interchange of experience, cannot fail to produce results which will be mutually beneficial and lasting. The Norfolk society is among the younger members of the agricultural family, but if her success is commensurate with the zeal and interest manifested by her members in the great cause she is seeking to promote, we may hope that she will not only maintain her present rank, but be able to exhibit, each succeeding year, marked and decided improvement.

MARSHALL P. WILDER, *President.*
EDWARD L. KEYES, *Secretary.*

Farms.

Two farms only were entered for premium. One by William M. Stedman, of Needham, and the other, by Henry Breck, of Dorchester.

The farm of Mr. Stedman consists of sixty acres. Twelve acres are covered with wood, mostly oak, of thrifty growth, entirely cleared of under-brush, and highly ornamental. The

tillage land embraces several acres of corn and potatoes, three acres of rye, two acres of barley, and a patch of oats. About three acres are devoted to fruit trees, which are well pruned and very thrifty. The remainder of the farm is grass land. The stock consists of one yoke of oxen, two horses, four cows, and seven or eight hogs. Everything about the premises was in good order, and showed economy, thrift, and careful husbandry. Mr. Stedman makes no pretensions to high cultivation, but he has every comfort and convenience around him, which are so characteristic of the good farmers of our county.

The committee examined the farm of Mr. Breck, in the month of July, and again in September. This farm is improved, partly for the milk business, and partly for the growing of vegetables, to be sold in the city of Boston, and in the neighboring towns.

The farmers of our county being so unwilling to compete for the premiums offered by the society, the duties of your committee were far from laborious. They therefore accepted an invitation to visit the farm of Aaron D. Williams, of Roxbury. This farm is mainly devoted to the cultivation of vegetables for Boston market. Large quantities are sent there daily, such as spinach, asparagus, peas, tomatoes, potatoes, &c. Dandelions, also, are grown extensively, and find ready sale at remunerating prices. Tomatoes are sent to market early in the season, and very large quantities of this healthful, and now indispensable vegetable are sold. Your committee were highly gratified in viewing the large and well grown crops produced by the care and good management of Mr. Williams. His fruit trees were laden with fruit, of the finest and most delicious varieties; they were all healthy and thrifty, except the peach trees; these were diseased, as your committee believe, by means of too high manuring for this fruit, and the consequent too rapid growth of the tree.

It is the aim of Mr. Williams, to have all the work on his farm done at the *right time*. The land is ploughed when it is not too wet, the seed is put into the ground at the most favorable moment, and all the crops are freed from weeds and hoed *thoroughly*. By attending to every part of his work *in season*,

and by *high cultivation*, he is enabled to obtain *two crops* annually, from a large portion of his land, and to realize a handsome income on the amount invested, equal to that received by a majority of our merchants. Nor is there any mystery in this. The like result may be obtained by any good farmer who will be content to cultivate no more acres than he has the means of cultivating in the *most thorough manner*, and who will keep in mind that the *farm* is the *place of his vocation*,—the theatre on which he is to display his knowledge and good management.

Your committee are convinced that farmers, as a class, labor under great difficulties,—much greater than are experienced by men of any other occupation. They are not, as a class, properly educated. They do not study like professional men, nor have they the advantages of mechanics and merchants, who necessarily meet and converse with each other daily. Their situation is generally an isolated one, and they cannot often avail themselves of the information to be gained by intercourse with other farmers. It is, therefore, of the greatest importance, that they should read books and treatises upon agriculture, and its kindred sciences,—more of which have been published within the last ten years, than for centuries previously. Otherwise, they must be content with what may be gained by their own practical experience,—a process of learning which is slow and tedious.

Your committee believe that too much cannot be said in favor of *seasonable and thorough cultivation*. The land should be cleared of stones, and completely drained. It should be ploughed and subsoiled frequently, to a depth of at least fifteen inches, until the whole mass is finely pulverized and mellow. A plenty of good stable manure should be incorporated with it, at the rate of not less than ten cords to the acre; or other manure, equally fertilizing, and in due proportion. The seed should be put into the ground as soon as possible, after a fine tilth is obtained. The surface should never be permitted to become *baked* or *to form a crust*, and it should be kept *entirely free from weeds*. In this way, the farmer may obtain more clear profit from a single acre, than he can from ten acres un-

der the common mode of culture in New England. Either this, or the *skinning method*, must be resorted to for profit. Ploughing four inches deep, with one horse, and applying two cords of manure to an acre, will produce a small crop at little expense. But no *half-way culture* will afford a remunerating profit, at the present prices of labor in our county. While on the other hand, a judicious rotation of crops, and seasonable, high cultivation, in order to supply our cities and manufacturing villages with such articles of necessity and luxury as cannot be brought from a distance, are almost sure to make the skilful, industrious farmer, *independent*, and with good health, *rich*.

Your committee regret that so much apathy should prevail in the county. And they earnestly entreat their brother farmers, in every town, to awake to their true interest, and to give evidence to the committee of the next year, that they are not inconsiderate of their own good, nor indifferent to the honor of Norfolk county.

Particularly would the committee express the hope, that no false views of the objects and principles of the society will prevent a more general competition. Our aim is the improvement of agriculture; our intention and desire is to encourage and reward industry, skill, and careful, judicious management, *wherever* they may be found.

We earnestly invite the humblest cultivators of the soil, to become competitors for the premiums offered to all. Those who possess but few acres, and with the smallest means, may, by energy, industry and good management, distance all competitors. And your committee regret that no opportunity has occurred to carry out what they conceive to be the design and wishes of the society in this respect.

The chairman being the owner of the farm cultivated by Mr. Breck, one of his associates reports for him in relation to that farm:

"The farm," says Mr. Newhall, "came into my possession partly in 1829, and partly in 1836. It was then, a large part of it, pasture land filled with large boulders of many tons weight, and covered with barberry bushes and wild roses. The boulders have been blasted and made into heavy stone wall;

the bushes eradicated, and the most part is now first rate grass land. Some part of it was low, wet land ;—too wet to produce any valuable crops. This has been under-drained, by digging more than two hundred rods of trench, two and a half feet deep ; filling in with fifteen inches of small stones picked from the land, and these stones covered with two or three inches of leather shavings. The remainder of the trench was filled with soil. The apple and pear trees have been pruned, some of them grafted, and all had the land around them cultivated. Have gathered the present year, ninety barrels of winter apples, and quite a number of bushels of pears, without setting out any more trees since it came into my possession. The first year I owned it, the produce did not exceed five barrels." So far Mr. Newhall. He is understood here to speak only of the portion of his lands occupied by Mr. Breck. On other lands he has planted many trees, and been a successful grower of fine fruits. We happen to know, also, that he has done much in the way of subsoil ploughing, trenching, manuring and enriching,—both on the lands hired by Mr. Breck, and on those to which he gives his personal attention. The barn built by him, and used by his tenant, is one of the largest and best we have ever seen. Therefore, in judging of Mr. Breck's farming, we must bear in mind the much that has been done, and well done, by Mr. Newhall, in the preparation of soil and buildings. It is rarely the case that a tenant can find a farm so well prepared in advance for producing plentifully, as this one was when its present occupant took it. A strong, heavy soil, almost clayey, never exhausted by tillage and hard cropping, now first made fit for the plough, relieved of its superfluous waters, filled with manure, and faithfully worked over with every suitable implement, is in just the best condition for yielding plentifully, in which it could be put. Therefore, unless Mr. Breck shall show good results very few will be ready to ascribe to him any peculiar merits as a farmer. His own statement is brief, containing little more than figures. But these figures indicate that he must have been a hard worker, a good planner, and successful in money-making.

His minutes show that the farm consists of seventy acres, viz:

46 acres mowing and tillage,
8 " pasturage,
16 " salt marsh.

The stock consists of twelve cows, one yoke of oxen, three horses, two swine.

The crops were forty tons English hay, from twenty-three acres; twenty-six tons salt hay, from sixteen acres; seven hundred bushels potatoes, from five acres, dug mostly in July. These, together with other crops, brought in market, or were worth, as follows, viz:

Potatoes,	$650 00
Peas,	290 00
Cabbages,	480 00
Sweet corn,	140 00
Tomatoes,	42 00
White turnips,	70 00
Ruta bagas,	95 00
Blood beets,	140 00
Carrots,	80 00
Squashes,	112 00
Fruit,	220 00
Rye and stover,	40 00
Hay,	200 00
Labor and team hired off the farm,	250 00
Sundries,	125 00
Milk,	1080 00
	$4014 00

Expenses for

Labor,	$680 00
Board of laborers	450 00
Manure,	180 00
Grain,	480 00
Rent and taxes,	740 00
Wear of tools, interest on stock and tools, and blacksmith,	200 00
	$2730 00

The result shown, by striking the balance between the debt and credit, makes Mr. Breck receive more than $1200 for his year's labors, though he pays to the owner of the farm a sum equal to the interest of more than $10,000. We award to Mr. Breck the merit of good management, (for nothing short of that could have accomplished so much, even on this well-prepared farm,) and the first premium of the society, of twenty-five dollars.

CHEEVER NEWHALL, *Chairman.*

Reclaimed Meadows.

The committee, having been elected again to perform the service entrusted to them last year, have continued a general observation of the lands which were then entered for the premiums offered by the society. These premiums, it had been understood, were to be awarded after the success of the experiment for which they were claimed, had been tested, in some measure, by the crops of two successive years *following* the entry of the claimants. We have ascertained, accordingly, what has been the cultivation of the lands referred to, during the past season, and what returns they have yielded.

It will be seen by the statement of Mr. Tubbs, that he now considers the cost of reclaiming his land, at an expense of nearly $200 per acre, a profitable investment. And we are disposed to add the expression of our own belief that such would be the result, even if but small returns, in dollars and cents, were annually received. In the improved appearance and increased value of his lands, rendering them more attractive and more saleable, together with his own gratification in the result of his labors, he would find his investment a satisfactory and profitable one.

That portion of his land which had been laid down to grass last fall, presented a strikingly beautiful surface in the spring, and yielded a fair crop of good hay, at the right time. By a further drainage of it, so that the surface water may entirely escape, and by the completing of the owner's plans, which

were interrupted this year, we have no doubt that a large and amply remunerating crop may be taken from it for many years to come. Upon that portion of the land which had been tilled last year, the crops of hay and spring grains were light. We apprehend, however, that a like result has been the common experience this year, in this part of the county. Potatoes, grown here, proved to be of excellent quality.

Mr. Tubbs is deserving, we think, of no small credit, for his energetic and persevering endeavors to reclaim and beautify this unsightly and unpromising bog. We accord to him the encouragement he merits, and would urge others to follow his example, wherever the means at hand will justify the cost of the experiment. An equally praiseworthy and successful experiment, upon lands immediately adjoining those of Mr. Tubbs, has attracted our notice, and presents a most encouraging example to any who are willing, by hard and persevering labor, to make for themselves a productive farm, out of an almost worthless bog. And we are confident that large tracts of similar bog and swamp land in our county, may be made, by similar means, to produce large crops of hay, grain, and vegetables, instead of remaining to disfigure its surface, to spread noxious miasma through the homes of its citizens, and to rebuke the farmers who own them.

The land of Mr. Salisbury embraces a portion of bog nearly, if not quite, as unsightly and unpromising, as are those lands to which we have already alluded. It had been, however, cultivated for a longer time, and had steadily improved under the care and judicious management of its owner. The crop of hay on this land was larger this year than the last, but diminished by a cause to which Mr. S. refers in his statement. We have no doubt that, when this obstacle is removed, the whole cost and labor of the experiment will be amply repaid. It will be observed, that Mr. Salisbury continues to enrich this land by the annual compost of his barn yard, consisting of coarse sand, or gravel, and the droppings of several cows. By this course, he is rendering the soil firmer and more compact, and the grass sweeter and more nutritious, as well as more abundant.

We think it worthy of remark, that Mr. Salisbury began this experiment when he was already far advanced in life; and that he has brought it to its present profitable state, by his almost unaided labor, at seasons when other work cannot well be performed. And we would again present his example as a rebuke to the timidity or sluggishness of many younger in years, and surrounded by far more favorable circumstances, who have upon their premises similar portions of waste land, or noxious bog.

A new entry of reclaimed meadow land has been made this year by Hiram W. Jones, of Dover, whose farm last year, received the third premium of the Society. This land is part of a low, wet meadow, which had been partly overgrown with bushes, and yielded only a meagre crop of coarse and sour grass. By judicious and persevering labor,—opening wide and deep rectangular drains, rooting out bushes, supplying a new surface soil, ploughing and enriching with manure,—the whole has been made smooth, firm and fertile; bearing large crops of excellent grass, capable of any desired tillage, and of yielding the most profitable returns. The operations and improvements of Mr. Jones, upon this and other land, have attracted much notice and commanded general approbation. Rarely do we see exhibited more satisfactory proof of the profitableness and expediency of improvements like that we have here been called to examine. And we commend the example as worthy of general imitation.

Your committee have awarded to Mr. Tubbs, the first premium of $15; and to Mr. Salisbury, the second premium of $10.

Mr. Jones, having offered satisfactory proof of the mode of reclaiming and cultivating his land, and also of the crops received therefrom, during the two years past,—thereby showing that his labors have been worthy of such encouragement, we recommend that a gratuity be made to him of $12.

In behalf of the committee,

CHARLES C. SEWALL.

B. H. Tubbs's Statement.

You wish me to give you a minute statement of the crops on my bog meadow the past season.

On the land you saw laid down to grass, I cut between three and four tons of good hay, and could have cut another ton of rowen, had I not chosen to feed it off. On one and a half acre, sowed with grass, oats and barley, I harvested only a light crop. On a corner of the land, about thirty square rods, I raised about ten bushels of very good peach-bloom potatoes. They were manured with compost in the hill.

I have not made much improvement on the bog this season, for I have been very much troubled with that bad complaint,—"the shorts,"—in the pocket. But I am very much pleased with this investment; and when I have anything more to dispose of in this way, I shall invest it in bog meadow, in preference, at least, to the Norfolk county or any air (castle) line railroad.

West Dedham, *Nov.* 25, 1851.

William Salisbury's Statement.

After you examined my meadow, last year, I carted on it, and spread forty loads of compost manure, and sowed more grass seed. I have now about fifty loads more of compost, made by covering the droppings of my cows, this season, with coarse sand and gravel, which I intend to place there as soon as the meadow is frozen sufficiently to bear up the load and team. I have cut, the past season, about three and a half tons of hay; and should have raised, it is probable, nearly double that quantity, if my labors had not been thwarted. A road has been raised below my meadow, having only a small sluice-way; and several of the past seasons being very wet in the spring, the water has set back and stood upon my ground. This, I think, has been a great injury, and I hope that it may be remedied another season.

Medfield, *Nov.* 24, 1851.

Hiram W. Jones's Statement.

The piece of meadow land offered by me for a premium, is a part of a large tract of meadow on what is called Trout Brook, and contains about three acres. The distance from the hard land to the brook is about twenty-five rods. The mud or peat varies from twelve inches in depth, near the upland, to six feet at the brook. The grass that grew upon it, in its natural state, was worth no more than the cost of harvesting. I began to reclaim it in 1839, by cutting large ditches, on each side, from the upland to the brook, and also between the upland and meadow, to receive the water that came out from the bank. In the fall of 1839, when the land was dry, I ploughed one half acre, at the corner of the piece, commencing at the upland and going as far towards the brook as the team could be borne. There were many roots and hassocks upon the piece, and it did not turn over very smooth. I then rolled it with a heavy roller, and let it remain until winter. I then carted one hundred and ten ox-cart loads of gravelly sand upon it, from a knoll near by; making it pretty smooth on the surface. In June following, when it was sufficiently dry, I harrowed it thoroughly,—mixing the sand well with the soil; I carted on ten ox-cart loads of compost, made one half of horse manure and the other half of sandy loam. Harrowed again, and sowed one bushel of oats, half a peck of herds grass, half a bushel of red top and four pounds of Western clover seed, and harrowed them in. In August, I cut a good crop of oats and clover. The cost of reclaiming this half acre was as follows:—

Ditching, - - - - -	$5 50
Ploughing, 3 men, 2 days, - - -	6 00
" 4 oxen, 2 days, - - -	4 00
Plough, 2 days, - - - - -	1 00
Rolling, - - - - -	50
Carting 110 loads of sand, - - -	8 50
Compost and carting, - - - -	10 00
Harrowing, - - - - -	1 00
Grass seed, sowing, &c., - - - -	2 00
	$38 50

In 1841 the growth of herds grass and red top was very heavy, and the quality excellent. It was cut the first week in July, before it was fully grown, and was estimated at over two tons to the acre. The second crop was cut about the middle of September, and was estimated at over one ton to the acre. Compost, of one-third part stable manure, and two-thirds sandy loam,—at the rate of fifteen ox-cart loads per acre,—has been spread on, late in the fall, every second year since it was sown to grass. And the crop has been as heavy and as good every year, up to the present time, as it was the first year,—both first and second crops. In 1843, the first crop grown upon this half acre was put into the barn, apart from the other hay; and when sold, in the spring, it weighed over twenty-one hundred pounds.

The remainder of the field was reclaimed by carting on sand, at different times,—covering it from two to three inches deep, spreading the mud from the ditches on the sand, and compost, of the same kind and in same quantity, as on the first piece. The crop taken from this, the first three years, was equal to that from the piece which was ploughed. But since that time, the natural grass has come in, although the whole field has been manured and treated in the same way. The whole has been mowed twice each year since it was first sown with grass seed.

Dover, *Nov.* 21, 1851.

Peach Orchards.

Three peach orchards were offered for the society's premiums.

Of the orchard of Mr. Porter, the committee would remark, that by the free use of the knife in shortening the new wood, and by the cultivation and management of his grounds, he has not only produced trees of fine pyramidal form, but crops of fruit which bear testimony to his judicious pruning and treatment.

Mr. Reed's orchard is systematically laid out. His trees are thrifty and well formed, but have not as yet borne fruit.

They give promise, however, of good crops; which opinion was confirmed by the examination of another orchard, planted a few years previous, that was producing large quantities of fair and fine specimens.

It will be noticed, that only a part of Mr. Porter's orchard, thirty-nine trees, have been planted "since the year 1848," and that Mr. Reed's not being in a "bearing condition," they are excluded by the terms of the premium list from competition. The committee noticed with pleasure, that they had adopted the system of mulching their trees with hay or straw, a practice known to experienced cultivators as invaluable in the production of fine fruits. Especially is this desirable on soils of a light character, such as those upon which the peach is usually planted. Under this system the earth is kept moist and cool, during the drought and heat of summer—the fruit much increased in size—the roots protected from the burning rays of the sun, the extreme frosts of winter, and the sudden alternations of the temperature, so fatal in the spring to the peach and other fruits.

With the orchard of Mr. Hubbard, the committee were much gratified. His trees are all of a pyramidal form, with clean, straight, sound stems, and round, compact heads of well-ripened wood, and the culture evinces the skill and good judgment of the proprietor. His orchard is planted alternately with apples and peaches; first with apples, afterwards, intermediately, with peaches, and the ground underneath is cultivated with cabbages and other vegetables. Whether this system is judicious, and to what extent it may be carried, without injury to the fruit crops, your committee will not undertake to say. In the early stages of the trees, this under-cropping might not be so deleterious, as in a more advanced state; but when in a bearing condition, the energies of the soil would require a constant and ample supply of the appropriate fertilizing ingredient.

The committee award

To Gardiner G. Hubbard, of West Needham, the first premium on peach orchards, - - $10 00

The committee also recommend the following gratuities:—

To Jason Reed, of Milton, - - -	$3 00
To Luther Porter, of Stoughton, - -	2 00

In closing this report, the committee beg leave to remark, that although the peach tree is not indigenous to our soil and climate, yet it was introduced early into the country, and has been successfully cultivated in different sections of the Union. The peach tree has been considered as of short duration, but its natural life, when grown in congenial soil and climate, and not affected by the worm or disease, continues to thirty or forty years; and instances are not rare, of still greater longevity. In the Middle States, where the peach is cultivated extensively for the market, the orchards are either renewed, or the location changed, as often as once in six or eight years.

In our latitude, the fruit buds are often injured by the late frosts of spring, or the severe changes from warm to extreme cold weather in the autumn. These circumstances have prevented the extensive cultivation, in our region, of this delicious fruit. Experience, however, has shown, that with the selection of proper soil, location and varieties, and judicious ripening of the wood, the peach may be cultivated in many parts of New England, particularly in our county, with great success. When we compare the obstacles which exist in Massachusetts, with those which afflict the cultivator of this fruit in New Jersey and Delaware, we shall find that not unfrequently the crop is injured or destroyed there, by the same causes which prevail here,—early or late frosts.

The committee are gratified to learn by their investigations, that the opinions here advanced are sustained by the experience of many who have recently entered upon the cultivation of the peach for the market, and that its culture with us has already become of no inconsiderable consequence, either as it regards extent or profit.

When we consider our proximity to a large market—the immense demand for this fruit, at the appropriate season—the superior quality of that which is grown here, above that brought from the south—that it can be grown on light soils,

scarcely suited to any other product—with less risk of drought than most other crops—that the contingencies of failure are not much greater with us, than in the great peach-growing states, we cannot conclude our report without recommending an increased attention to this branch of cultivation.

MARSHALL P. WILDER, *Chairman.*

Luther Porter's Statement.

My peach orchard consists of ninety-four trees; seventeen of them remain where the stones were planted. Thirty-eight were set in the spring of 1848, and thirty-nine set in the spring of 1849. They have all been trimmed or headed in, and the dead wood cut out in the spring.

I prefer to have them headed, or shortened in, as the fruit is larger and more easily gathered, and the fruit not so easily blown off by the wind. The soil is a sandy loam, situated on the southern side of a hill. One half the ground has been planted as a garden, with hay around the trees. The other half has for the last two years been entirely covered with hay, spread in March, when the ground was frozen. The buds are thereby kept back, and are not so liable to be killed by the cold in April and May. It keeps the weeds and grass down, and the ground moist and light in the hot days of summer. I also think it the best manure, when the hens have mixed it with the soil, which they are sure to do, if they have access to it. Some two weeks before my peaches are ripe, I shut my hens off, and I then have a clean, soft bed for them to fall on. In 1849, I put one half pail of scalding soap-suds on to each tree, and let it run down the butt, into the soil. Since that time, I have not taken pains to heat it.

To keep the borers off, I apply ashes two or three times a year, and examine them very closely during the season, taking care to keep the hay from the butt, so as not to encourage them around the root.

My trees were one year from the bud when set. Last year they produced about twenty bushels of large, handsome peaches, the most of which sold for one dollar per bushel. This year you will judge of the quantity.

STOUGHTON, *Sept.*, 1851.

Jason Reed's Statement.

The peach trees examined by the committee were set out May, 1850, having one year's growth from the bud. They were set in sward ground, which was turned over the November previous.

In transplanting, the roots were covered with soil taken from the surface of a cultivated field adjoining, and the holes filled with the *sods*, and earth taken out.

The number of trees is two hundred and ten; set at the distance of about twelve feet apart, or averaging two trees to the square rod. The ground has been cultivated with corn and potatoes, and in June, last year and this, leached ashes have been placed about the trunks of the trees, at the rate of a bushel to about ten trees.

The ground has been manured very lightly each year—not exceeding the rate of about three cords to the acre, placed in the hill.

Milton, *Oct.* 31, 1851.

G. G. Hubbard's Statement.

The peach orchard offered by me for premium, contains nearly three hundred trees, set out in the spring of 1849. The trees were one year old from the bud. The varieties consist principally of Crawford's Early, Malta, Noblesse, President, George IV, and some good budded fruit from seedlings of a neighbor of mine. Most of these trees bore well for their age. I marketed this year nearly fifty bushels, besides a number of bushels which were used on the place. Owing to the drought, some kinds dropped their fruit, and the crop was thereby considerably diminished. There are over five hundred peach trees in this orchard, some set out in the year 1848. All of these were budded and tied by myself and man. *No one* has touched them with a pruning-knife but myself.

West Needham, *Nov.* 24, 1851.

Ploughing.

The committee do not regard bad ploughing as the besetting sin of our cultivation; we have strong teams, good ploughmen, and the best ploughs in the world—and we need the best. To say nothing of rocks and roots, where else but in the northern States of this Union, especially New England, is it regarded as good culture, to suffer the best arable lands to rest in the sod, producing grass three-quarters of the time? The process of breaking up an old grass field of five or six years' standing, which occurs annually on all our large farms, is almost unknown in the grain regions, where one or two successive hay crops are the utmost ever raised. This peculiarity in our husbandry, is mainly caused by the high price of labor, inducing the owners of large farms often to content themselves with the produce of one ton of decent hay from an acre, in preference to incurring the expense of labor and manure, which the highest cultivation would involve. Another cause for this practice may be found in the fact, that our soil and climate are especially favorable to the production of hay. The cultivation of a perennial crop like grass, which is emphatically the staple produce of our farms, renders the operation of the plough more difficult, though less continued, than under the European system of agriculture.

Our exhibition was confined to the breaking up of an old grass field, of rather light land, of hardly eight inches surface soil, and was regarded as a specimen of autumn ploughing. Good work of this kind requires a straight furrow, turning a sod of ten or twelve inches in width, so far inverted as entirely to conceal all vegetation, and yet to suffer the edge of the slice to rest upon its neighbor sufficiently to prevent it from falling flat into the furrow. This was done well by all the teams.

The Michigan Sod and Subsoil Plough, used by Mr. French's team, is undoubtedly a valuable improvement for breaking up land to be immediately planted or sowed. It splits the furrow slice horizontally, about three inches from the surface, and the main head of the plough following, throws up the bottom of the furrow in a pulverized state, so that newly broken up

ground presents somewhat the appearance of fallow ploughing. It appears especially adapted to our mode of cultivation, as it disposes at once of the old sod, which is so apt to interfere with the new crop. There can be no possible view of its operation, which will render its work less valuable than that of the common breaking-up plough; and your committee feel confident that a more extended acquaintance with this instrument, will cause its extensive use upon our tough-sodded grass fields. Fallow ploughing, the most common use of the plough, cannot be conveniently performed at a cattle-show. Whether the deep ploughing, so much in practice in England at the present day, extends its benefits to grass crops as well as roots and grain, we are not informed.

For the Committee,

JAMES M. ROBBINS.

Fat Cattle.

Four fat oxen, six years old, and not of the largest size, were entered for premium, by William Enslin and John Ayres, of Roxbury, the heaviest pair weighing 4,300 pounds. All were well fatted animals, and spoke well of their owners, and very emphatically of the good quality of their pastures, as grass had been their only feed since June, and as one pair of them had drawn in, the most of 150 tons of hay in the haying season. Had there been given the committee the weight of each ox at the time he was turned to pasture in June, and the weight of each at the time of the exhibition, they would have been better able to form a correct judgment. Without this aid, in case of several competitors for a premium, it might be difficult for a committee to arrive at a conclusion satisfactory to themselves. But there appeared to be no competition in this case, and having understood that the cattle were only in good working order at the time they were unyoked for the pasture, and that they all had made a gain unusually remunerative, your committee awarded to Messrs. Enslin and Ayres the premiums.

LEMUEL HUMPHREY, *Chairman.*

Milch Cows.

Only two of the competitors furnished any statement. The committee have awarded only two premiums.

The first to S. J. Capen, of Dorchester, for his dark red cow, "Flora,"—one half Ayrshire and one half Durham,—five years old. She calved in April, 1850. One year from the next June, from June 1st to 10th, she averaged 8 qts. of milk per day, weighing 19 lbs. Was fed on grass alone. She calved again on the 15th of August last. The calf was taken from her August 30th, and weaned. She gave, on the average, from September 1st to September 10th, 25 qts. per day, weighing 58 lbs. She was fed on grass, corn fodder, 1 qt. of Indian meal, and 2 qts. of shorts per day. The milk was not made into butter.

The second to David N. Hollis, of Braintree, for his native cow, four years old. The cow gave, from the 10th of June to the 20th, 164 qts. of milk, and made 20 lbs. and 2 oz. of butter. From the 10th of September to the 14th, she gave 44 quarts. The weather being very warm, the milk was sold. From the 14th to the 20th,—six days,—she gave 63 qts. 1 pt. and a half; making, in the whole, 107 qts. and 1½ pts. From the 14th to the 20th, she made 8 lbs. and 6 oz. of butter, from 63 qts. and 1½ pts. of milk.

This cow has not had one quart of meal, or any other grain, for more than a year. In June, grass; in September, grass, with stalks. She calved the 6th of May last.

The number of cows offered for exhibition, was large, and, in the opinion of the committee, one of the choicest lots ever exhibited in this State.

Thomas Motley, Jr., of West Roxbury, offered some very fine blood cows. His Jersey cows, recently imported by him, attracted great attention. We very much regret that Mr. Motley did not furnish us a written statement, to be published for the benefit of the society.

Samuel Henshaw, of Brookline, exhibited four full-blood Durham cows, which, in the opinion of the committee, were

superior cows for the dairy. He also exhibited two fine Jersey cows.

The following is the statement of the products of Mr. Henshaw's Durham cow, "Maggie," seven years old:—

From June 10th to 19th, inclusive, 1850, she gave 555 lbs. of milk, producing 21¾ lbs. of butter; from September 10th to 19th, inclusive, 1850, she gave 409 lbs. of milk; from June 10th to 19th, inclusive, 1851, she gave 656½ lbs. of milk, which produced 21 lbs. 1 oz. of butter; from September 10th to 19th, 1851, she gave 300½ lbs. of milk, from which 12 lbs. 3 oz. of butter were made. This cow has never had any grain or meal, since he has owned her. The falling off in the quantity of milk this month, as compared with last September, is owing entirely to the dry state of the pasturage.

B. V. French, of Braintree, exhibited several fine cows. His pure North Devon cow, "Cyprens," attracted much attention.

G. G. Hubbard, of Needham, exhibited two North Devon cows; the milking qualities of which your committee cannot judge, but their form and color were perfect.

S. J. Capen, of Dorchester, exhibited several fine cows. Among the number was the celebrated Holstein cow, "Jessica," which received the premium at the American Institute, in 1850, when she gave 15 quarts of milk at a single milking.

The President of the Society exhibited a fine native cow, which has given 25 quarts of milk per day.

J. P. JONES, *Chairman.*

Swine.

G. W. Shaw, of Grantville, had a very good sow entered as a Suffolk, which had excellent points, and had produced very good stock, some of which were in the pens.

G. G. Hubbard, of West Needham, exhibited a sow, three-fourths Suffolk, one-fourth Essex; also, two very nice barrow hogs, raised from his sow, which the committee considered worthy of notice. After examining the two sows and their

stock, the committee found it difficult to decide which was entitled to the first premium.

G. G. Hubbard exhibited a superior Suffolk boar, two years and five months old, which the committee would cheerfully recommend to the public.

Thomas Motley, Jr., of West Roxbury, exhibited a Suffolk boar, but recently imported, which has excellent points.

G. W. Shaw and Luther Gilbert, of Grantville, each exhibited fine looking Suffolk boars. Mr. Gilbert made a very good statement respecting his boar, and also produced evidence of his usefulness. They think, that as Mr. Gilbert made a written statement and produced evidence of the usefulness of his boar, and Mr. Shaw did neither, Mr. Gilbert should have had the first premium. The error having been made on the day of the exhibition, it is not deemed advisable to change the award.

B. N. Sawin, of Dover, exhibited a very fine boar, five months old, and made a written statement, which entitles him to credit.

The litters of weaned pigs were all very good, and some of them superior.

The committee consider the raising of good swine important to the public, and in order to judge of the good qualities, the keeping and care should be taken into consideration; therefore, the committee would recommend that written statements be required of all entering swine for premium.

ELIJAH PERRY, *Chairman.*

Luther Gilbert's Statement.

I offer, as competitor for the first premium, one full blood Suffolk boar, from the *imported* stock of the late William Stickney. I also offer, for the first premium, four weaned pigs, out of a full blood Suffolk sow, from the same imported stock by my Suffolk boar, and as proof of his *good* qualities.

By request of your society, I offer a statement of facts. First, of the boar. He is twenty-two months and twenty-one days old. For the first twelve months I kept him on as little food as I could, he not having more than one third the quantity or quality of food that my native pigs had, of the same age. And

he kept in better order than the natives on that keeping, my object being to keep him as poor as possible, so as to have him fit for use as soon as I could. (Mr. Stickney informed me that the Suffolks would breed much younger if they were kept poor). The first time he was used as a boar, was when he was about twelve months old. He has had, since that time, sixteen sows, whose time has expired, that have produced in the aggregate, 134 pigs; some of which had twelve and fourteen pigs to a litter. In all, he has had twenty-seven sows; ten of my own and seventeen of others, for which the rate is two dollars for each sow. He has been kept on low diet, until the last twelve days, when I put him up to good keeping, on which he gained twenty-two pounds in ten days. As you will perceive, I could have made him much larger if I had fed him longer; but I did not want to, for fear of hurting his breeding qualities; also, being aware that your premium is offered for the best, and not the fattest boar.

My four pigs are four months and three days old. They have not had any extra care or keeping until the last twelve days. They were weaned when they were six weeks old, and have been kept since that time, mostly on rice meal or shorts, and some green corn-stalks, and some windfall apples. They have been for the last twelve days kept in the same pen, and have eaten out of the same trough with my boar. In order to ascertain what they all eat per day, I weighed out their meal part of the time, and found that the boar and four pigs would only eat eight pounds of rice meal and eight pounds of Indian meal, scalded, per day. For the last three days, the pigs have gained seven pounds.

NEEDHAM, *Sept.* 24, 1851.

Benj'n N. Sawin's Statement.

The pig entered by me for exhibition, is half Suffolk and half native breed. He was taken away from the sow when he was eight weeks old, and weighed 43 pounds.

Weighed at	12	weeks old,	73	lbs.	Gain in	28	days,	30 lbs.
"	16	"	110	"	"	28	"	37 "

Weighed at 19 weeks old,	150	lbs.	Gain in	21	days,	40	lbs.
" Sept. 13,	179	"	"	16	"	29	"
" " 19,	192	"	"	6	"	13	"
" " 24,	204	"	"	5	"	12	"
			"	104	"	161	"

He has had nothing more than common feed—skim milk, pork scraps, raw apples, &c., which cost, on an average, about four and one half cents per day.

Dover, *Sept.* 24, 1851.

Poultry.

The character of the contributions was greatly superior to that manifested the previous year, and exhibited itself in all the varieties brought forward, which included the choicest sorts, and especially in the case of distinctive breeds, which are generally cultivated in Norfolk county. When the great and rising importance of poultry improvement is taken into consideration, the fact stated must be gratifying to members, zealous that the objects of the society should be prominently exemplified, even in the meanest of its details of practice. Collateral circumstances prove that poultry breeding in the county of Norfolk in this State, places it in the position that the English county of the same name, has long upheld, viz., that of being the leading district in the country in the improvement of domestic poultry, and the cultivation of the best modes of managing that interesting department of domestic economy. Not only has Norfolk made the poultry department the most interesting of its annual exhibitions, but she has carried off the palm of merit at the fairs of the New England Society for the Improvement of Domestic Poultry. While this fact is to be contemplated with a feeling of pride, it has bearings indicative of more substantial results, as your committee will briefly attempt to show.

The quantity of poultry raised within the county, it may safely be said, has been more than quadrupled compared with

what it was five years ago. This has been, to a great extent, effected by improved management alone. A few years ago, poultry was considered an adjunct to every barn yard ; but very few took the trouble to treat it on a systematic principle. Fowls were strictly kept upon their own shifts, without any recognition that they had wants, or that an attention to their necessities and comforts would be productive of any benefit whatever. Breeds were suffered, through the same carelessness, to degenerate into varieties offering no distinctive type of their origin; and no one acquainted with fowls will wonder that this degeneracy affected their size, as well as other properties. By the assignment of a proper value to fowls, and a scientifically-conducted system of managing them, their weight has been increased at least one half, while their producing properties have been conserved, to say the least; it would not be difficult to attest the statement that they have been greatly augmented. The larger number of fowls kept within the county will account for the remaining increase, which may be greater than what is specified.

The advantage proceeding from regular treatment and management, is, that a less quantity of food would feed it fat if given systematically, and accompanied by other conditions calculated to promote cleanliness and secure comfort.

It will not be difficult to deduce the conclusion that pecuniary profit must be the natural result of increased produce, cheap and orderly management in the poultry yard; neither will it be hard to discover that these consequences lend an importance to poultry keeping, which ought to keep it before the society as one of its most prominent interests.

Your committee might specify many particulars corroborative of the importance of this branch of economy, but will simply allude to one, and that one which promises to confer much benefit on Norfolk county. The names of the principal fowl breeders within its bounds are, perhaps, better known among amateurs in poultry-raising in the south and west than at home, on account of the large quantities of fowls exported to those quarters by the farmer. The specimens imported are of the best classes of all distinctive varieties; and the trade grows

extensively every year, and produces good returns for stock; but the character of the trade has been ratified by the sale of fowls of undoubted purity of blood, and not by the disposal of impure specimens. The remarkable size to which fowls bred in the north, attain when carried south, promises to make New England the great arena for the raising and sale of this description of produce for the southern and western states. But it ought to be kept in recollection, that nothing but what is genuine can succeed in giving satisfaction; and that no means will be so effectual in destroying the good name and pecuniary interest of the New England breeders, as the imposing of impure stock on purchasers at a distance for the genuine.

Your committee will now proceed to enumerate the several classes and descriptions of domestic poultry exhibited at the late show, appending such observations as a careful inspection of their merits justifies.

Black Spanish.—The contributions of J. P. Childs and C. B. Ward, were specially possessed of merit. The former were of the stock brought from Scotland by Mr. Fricker. The latter were of the stock imported by Francis Blake, Newton Falls. Both are well known to be of the purest blood,—they having been bred with peculiar care before and since their arrival in America. This breed is characterized by its glossy, sable plumage, extremely ample development of comb, and wattles of pure scarlet color, with silvery white cheek pieces, in contrast to the deep black of the feathers. Those who breed for the combined properties of fine flesh and steady laying, could not do better than provide themselves with the Fricker or the Blake stock, which are equal in merit. Their flesh is white, tender and juicy; they are unequalled as layers, and their eggs are large sized and finely flavored. They are beautifully rounded in form, majestic in attitude, and altogether an ornament to the poultry yard.

Black, yellow and white Shanghae Fowls.—Your committee recognized very marked improvement in this department; although it was not without its element of alloy. Several items were exhibited of those long-legged, crane-necked, big-headed fowls, which exemplify the possession of useless

offal rather than any other property. The presence of such produce from any one's stock, goes plainly to show that some foreign cross has been incorporated into its constitution, which careful breeding and coupling alone will ultimately eradicate. Such description of fowls is generally noted for an unusual greediness for food, to expend which in an immoderate degree, is exceedingly injudicious when mere offal is the principal return.

The points which ought to distinguish the pure varieties of the Shanghaes are as follows:—

Their general characteristics are great size, roundness and shortness of body, width of breast and back, with medium height corresponding to their weight, much after the model of the best of the Perley stock of Shanghaes. The pure breeds are close-feathered, generally exceeding the weight the best of ordinary judges would assign to them by mere calculation, after a simple glance. Their flesh is fine in fibre, yellow and juicy, and of delicate flavor. They are prolific layers; and when at maturity furnish large eggs. The best breeders generally have their broods produced early in the season,—not later than the latter part of May.

All pure varieties,—brown or white,—are hardy, nevertheless; males generally average from ten to twelve pounds when a year old, and females from eight to nine pounds. In every respect they are a most desirable description of fowl. The best specimens of the Marsh stock were shown by H. H. Williams, West Roxbury, A. White, East Randolph, Charles L. Copeland, Milton, and Francis Alden, Dedham. The best specimens of the Forbes stock were shown by E. P. Stetson, Walpole, and Silas Belcher, Foxborough. The best Fussell stock was shown by John Fussell, Jamaica Plain, John Shorey and C. B. Ward, Dedham. The black Shanghaes, shown by J. S. Belcher and A. White, East Randolph, elicited much praise. The only lot of Perley Shanghaes was contributed by Francis Alden, Dedham.

The specimens of *Cochin Chinas*, shown by A. White and J. S. Belcher, were unexceptionable.

Bolton Grays.—The fowls of this variety on exhibition

presented characteristics of great purity of breed. The silvery whiteness of their plumage, minutely and uniformly pencilled with black, their small, neat, rounded forms, sharp pointed, double rowed combs, large and round wattles and delicately white ear lobes, with definitely marked hackells, evinced the care with which the specimens on show had been bred. The Bolton Grays are excellent layers, easily kept, healthy and hardy, moderate in their demands for food, and particularly eligible as stock, where an ornamental quality, with common care, are considerations. Specimens possessing the characteristics named, were shown by E. S. Rand, Jr., John Shorey, Theodore Shorey, Dedham, and James Cobb, Canton.

Fayal Fowls.—Those of this description, the original of the Improved Black Spanish, exhibited by John Fussell, Jamaica Plain, and C. B. Ward, Dedham, were very fine. They are good layers of the *largest* sized eggs,—exceeding that of any other fowl of similar size. The weight of the male is from four to six pounds, while that of the female is from three to four pounds, having all the characteristics of plumage and other markings of the Black Spanish.

White Dorkings.—Among the many varieties which are cultivated by the most discerning breeders, this seems to be the one prized to the highest degree. It is what may be emphatically designated a *model* fowl, in consideration of its physical proficiency, and producing and other qualities. No fowl, certainly, is better suited to meet the general wants of poultry keepers, or to the production of profit, to use plainer terms. They are what is called "partridge built," round and compact in form, carry more flesh to their amount of offal than any other breed, are hardy in their habits, good layers and setters, and grow, the males from seven to nine pounds when at maturity, the females, from five to seven pounds. They are easily reared, and reach maturity much sooner than any other description of poultry. Their flesh is white, tender and juicy; in fact, nothing can exceed them as a table fowl. It is difficult to obtain pure specimens in this country; and those exhibited were principally from recent importations by members of the society. All the features of color and distinctive

markings assigned to the Dorkings by the best judges and ablest writers, were present in the specimens shown. There is a peculiarity about this, and other fowls, which may be mentioned here.

When bred *in and in* for a length of time, the comb,—always single in the carefully bred fowl originally,—becomes double, which some recognize as a mark denoting degeneration, while the uninitiated set greater value on those having a double or rose comb. Whether this may arise from physical disability or not, your committee will not undertake, at this time, to decide; certain it is, that the introduction of fresh blood into stocks demonstrating such features of degeneracy, (admitting them to be such,) is a certain means to counteract its progress.

Aylesbury Ducks.—Your committee would recommend attention to the advantages arising from the breeding of this variety of the duck tribe.

The principal one is, the greater weight to which they attain at the commencement of the winter season than any of the more common varieties; but they are also beyond comparison with the common sorts, in point of easy management and productive qualities; they are the earliest layers and setters of any of the varieties.

In the latter respect, none are easier to propagate. They are beautifully ornamental,—have fine white, downy feathers, pure colored skin, and white, delicate and savory flesh, which, associated with their large size, render them the most marketable fowls of their kind,—the most profitable in every respect. At seven to eight months old, they attain to the weight of ten to twelve pounds per pair.

China (or Tchin-Tchu) Goose.—Some of the contributors entered them under the name of Mountain Goose, which was not correct; for the Mountain Goose,*—a misnomer with us,—is a judicious cross between the Tchin-Tchu and Bremen or Embden Goose. The former variety, in its purity, attains at

* Mountain Goose,—Anas picta,—is larger than the tame goose, and has the head, neck and quill feathers of the wings of a very beautiful glossy green. It frequents the valley of *Wareren*, or Roode-sand, and is sometimes seen at the Cape of Good Hope.

maturity to nearly fifty pounds per pair, while the latter attains to from thirty-five to forty pounds per pair. Early maturity is one of the most noted characteristics of this cross. They can be reared to fourteen pounds weight, dressed, in sixteen weeks. The cross is one of the most acceptable descriptions of fowl that can be brought to market; where it always commands a high price.

Your committee noted some specimens which had a small protuberance, or knot, on the necks of the China geese exhibited. It appears to your committee that this feature proceeds from an infusion of the blood of the *Anas-melanotus*, or black-backed goose, with the Tchin-Tchu variety, which forms one part of the cross, showing that there had been a cross previous to the importation of this lot. The black-backed goose is a native of the country to the north of the Ganges, and is to be found in Ceylon and Madagascar, and is said to be the largest variety of goose.

The variety contributed are called by the various names (though erroneously) of Hong Kong, &c. It is agreed, on all hands, by those who have visited Hong Kong, that *no* variety of fowl is bred at that place. C. R. Belcher, East Randolph, exhibited the best specimens of the Tchin-Tchu and Bremen geese.

Black Bantams.—Some of the finest specimens of this clean-legged variety were shown by Francis Guild, Dedham, and John Fussell, Jamaica Plain.

Native Fowls.—A fine lot of native, or dung-hill fowls, were shown by William Hill, Dedham.

Black Turkeys.—Nearly equal praise should be accorded to those exhibited by Lemuel Kingsbury, Needham, and John Dean, Dedham. They were all dark in plumage, and showed a strong infusion of blood of the wild breed.

Silver Pheasants and Sebright Bantams, in their purity, were shown by Charles Sampson, West Roxbury, and added much to the interest of this department of the exhibition.

In conclusion, your committee would urge on members the importance,—as has been before hinted,—of breeding from the purest of the distinctive varieties of fowls, whether for per-

petuating a variety in its purity or successful crossing. The first aim of every one who would raise fowls should be, to possess himself of the purest stock of whatever description he may fancy or deem best suited to the circumstances of his location, climate and other conditions. Every denomination has its standard of merit, and it is desirable to have that standard raised as high as a regard to the distinctive qualities and stamina of its members will allow.

The committee would suggest that, in future, some rule should be definitely laid down whereby popular judgment could be regulated on unerring principle; they would further suggest that the prizes should be distributed so as to embrace a larger number of known popular varieties of barn-yard fowls, with a view that this definitive process should be made to embrace the whole of them; also that the number of gallinaceous fowls should not exceed twelve of the choicest specimens, to entitle the contributor to compete for the best lot of fowls.

We would further recommend, in consideration of the obvious importance of poultry raising, that a prize be offered for the *best Essay on the Management of Domestic Fowls*, with reference to the special conditions of climate, and other influences in Massachusetts, which affect this item of domestic economy. This prize might not be less than $25, and, should a larger sum be assigned by the society, it would not be spent in vain.

EBEN WIGHT, *Chairman.*

Dairy Products.

There was awarded on butter:

To Rev. C. C. Sewall, of Medfield, 1st premium,	$10 00
" George F. Adams, " " 2d "	8 00

The committee recommend, also, that the society's first premium of $10, on milk of any number of cows *more than seven*, be awarded to John H. Robinson, of Dorchester, who has made a long and valuable statement of the number of cows kept by him; of the quantity and value of their milk, and his method of keeping them.

Charles C. Sewall's Statement.

I offer, for premium, twenty pounds of September butter, a part of 986 pounds, made on my farm between the 20th of May and 20th of September, 1851. I have milked ten new milch cows and two farrow heifers during the season. My family has consisted of from twelve to seventeen persons. New milk and cream have been used freely at the table, particularly the former, in large quantities, daily, for several young children.

Eight of these cows received *only* grass feed, and, occasionally, corn stover. One had, in addition, from one to two quarts of meal most of the time; and two have had a few pumpkins during the last week.

The cream was allowed to stand thirty-six hours in a cool room, and was then placed in stone jars, and kept, generally, on ice. The weekly gathering was churned in two parts. The buttermilk was thoroughly worked out with the hands, and the butter salted with the usual proportion of fine rock salt.

The whole management of the cream and butter has been the work of one of my daughters.

Medfield, *Sept.* 22, 1851.

George F. Adams's Statement.

I offer, for premium, two boxes of September butter, containing twenty-five pounds. I have made, since the 20th of May, 408 pounds. From the 20th of May to the 25th of June, I had but two cows; after that time, four and five cows; but since the first of August, we have churned only from four cows.

There is nothing unusual in our method of making butter. The milk is kept in a cool room, and generally stands about thirty-six hours. The buttermilk is worked out with the hands.

The salt used was fine rock salt, about one ounce to the pound. The feed of the cows has been grass and some corn fodder.

Medfield, *Sept.* 23, 1851.

John H. Robinson's Statement.

I send you a statement of the product of milk from my stock of cows, consisting, a part of the year, of twenty-one head, and another part, of sixteen head; five having been sold in the course of the first nine months of the year, so that the whole stock for the year would average nineteen head.

I accordingly predicate my statement and estimate of milk, as being the yield of nineteen head for one year, from September 1, 1850, to September 1, 1851.

The time of their calving was as follows:

1 in January, 1850.
5 " October, "
9 " November, "
2 " December, "
2 " January, 1851.
2 " February, "

21 total.
Deduct 5 of the above sold in the first nine months.

16 balance of stock on hand, July 1, 1850.
Add 3 as the average for the whole year of those sold.

19 whole stock for the year from September 1, 1850, to September 1, 1851.

As my milk was all sold to the same men, for the Boston market, I can give an accurate account of it, and also the amount received for the same. The following memorandum will give you the quantity and prices obtained:

From September 1 to October 1, 1850,	667 galls, at 11 cts.,		$73 67
" October 1, 1850 to January 1, 1851,	2,239¾ "	" 14 "	313 56
" January 1 to April 1, 1851,	2,793 "	" 14 "	391 02
" April 1 to July 1, 1851,	2,577¼ "	" 11 "	283 49
" July 1 to September 1, 1851,	1,189¼ "	" 11 "	130 81
Total, - - - -	9,466¼ "		$1,192 55
Add the quantity used in the family, say 1 gal. per day, - -	365 "	" 12½ "	45 62
Total yield, - - -	9,831¼ "		$1,238 17

You will perceive that my cows all come in with calf in the fall and winter, so that they had not the advantage of pasturing, at the time of calving. They were well fed and cared for, however, being kept in a warm barn and fed with great care and regularity, and watered three times each day and evening through the winter; the last watering in the evening at eight o'clock, which process is performed in the barn. My feed is salt and English hay, about half each, with shorts and grains mixed, say half a bushel to each cow in milk per day. The cost of this feed of grain, is five cents per head each day. My stock, in the spring, were all in first rate order, and would sell, for slaughter or fattening, for nearly as much per head as they cost in the fall.

In the summer, as my pasture is small, and does not afford sufficient food, I raise corn fodder and begin to feed as early as possible once a day,—recently, owing to the drought, twice each day. The quantity that can be raised on an acre is such as to make it, in my opinion, the cheapest and best crop that can be raised for summer feeding.

If, after taking into account the number of cows, you find the yield such as to entitle me to the favorable consideration of the committee, it will be acceptable to me, but not unless my stock deserve it. It cannot be supposed that so large a stock will be made to yield so much per head the year through as a smaller stock. The yield per head for the whole year, I think will not fall much short of one and a half gallons per day.

Dorchester, *Sept.* 25, 1851.

Bread.

Simple as this aliment appears, it is susceptible of great improvement, by attention, labor, and a little philosophy. A hint to the ladies, in any good work, is always sufficient. Your committee would not venture even to make a suggestion on this subject, were it not of vital importance to the community, that *good bread* should be found upon the table of every person in the country.

There is an abundance of what may be termed "fancy" bread, made in almost every family; but there is but here and there a housewife who can place upon her table a loaf of unexceptionable bread, of her own manufacture. Now there is no good reason why this should be the case, as the ingredients to make good bread are always at hand in this country, viz., good flour, good yeast, good water, and good salt. These are the only things that should ever enter into the composition of bread; milk, molasses, and alkalis, should never be used,—these only deteriorate and take from its excellence; neither should any of these ingredients enter into the composition of the yeast.

The materials which go to form good bread, are liable to three fermentations, viz.: first, vinous; second, acetous; third, putrefactive. The first, makes the bread light; and at this stage, the dough should be baked; the second, makes it sour; the third, totally ruins the mass. All the ingredients, except the four first named, tend to hasten and bring about the second and third fermentations, and to spoil its healthful and nutritious qualities. The good housewife will therefore make this subject a matter of watchful care; experience will soon point out to her the precise moment the bread should go into the oven.

The committee may, perhaps, have already dilated upon this subject, beyond what may appear necessary in a report; but as *good bread* appears to them to be of great importance, they venture a few hints in connection with this case, viz.: on *ovens*. For after all the good wife's care, if she has not an oven of the right sort, she will never produce *the best bread*. An old-fashioned oven, built of brick, is the best for baking bread, and will give a "better bake" than any stove now in use.

After the bread is taken from the oven, it should be placed in some open, airy situation, that it may imbibe the oxygen, instead of being covered up, as is often the case; thus preventing the hydrogen being thrown off by a proper process of cooling. But enough; these few hints may prove useful to some good lady who is aiming to take the first premium for good bread, at the next exhibition of the society.

Believing, as your committee do, that *the best bread* can be

made with the four articles above-named, they have refrained to submit any of the statements made, as to the materials used, or the manner of making the bread exhibited. Practice, and that alone, will make the housewife perfect in this useful art.

SAMUEL WALKER, *Chairman.*

Bees and Honey.

You offered two premiums for the best display of honey, one of eight, the other of four dollars. They were sufficiently liberal premiums. The raising of bees demands but a very small original outlay. If the enterprise be at all successful, the remuneration is large enough for its own reward. There are, however, desiderata which justify the encouragement in your power to grant. First of these, is a hive that can be conveniently attended, and answering all the ordinary purposes demanded for the deposit of honey. These are, a principal hive and connecting boxes, with easy and well arranged passages, and which can be added or removed at pleasure, with the least possible disturbance to the bee. Second, an arrangement that, preserving the above conditions, shall effectually prevent the intrusion of the bee-moth, or bee-pirate. Third, a feeding apparatus,—and lastly, a bee nutriment, that shall ensure the life of the insect in deficiency of a supply of honey, and, if practicable, increase the quantity of honey. There are many hives constructed, that rather resemble the Cretan labyrinth than a bee-hive, the geography of which, is about the study of a life-time.

The committee, having these points in view, hoped for an opportunity of instituting comparisons between different hives and different results of experiments. In this they were disappointed. One hive was presented, but having no pretensions above many others in frequent use; and a few glasses of honey were presented by another contributor, without any model of the hive, or statement of facts.

We know that Norfolk county *could* furnish 20 or 30 competitors, and we trust another year will elicit facts, to show

how the bee-house may rival the poultry yard, or yield, at least, a handsome compensation on a small capital.

SAMUEL B. BABCOCK, *Chairman.*

Grain Crops.

Claims for premiums were entered by the following persons, viz.:—Horatio Mason, of Medway, on wheat and barley; H. W. Jones, of Dover, on Indian corn, winter rye and oats; H. Robinson, of Needham, on spring rye; William Pierce and G. Revere, of Needham, on Indian corn. All the fields were examined by one or more of your committee. It was our desire to obtain accurate information; we wished to ascertain the *essential facts* in each case; we wished to have our report *based* on *facts*, and *facts only*,—for such basis is alone reliable and useful.

Mr. Mason raised 25 bushels of wheat on 180 rods, or at the rate of between 22 and 23 bushels to the acre. This, though not so large a crop as raised by Mr. Mason last year, is nevertheless much larger than the average crop to the acre, in the great wheat-growing state of Ohio. This is an encouraging fact for Norfolk county. The premium of ten dollars is awarded to Mr. Mason. Your committee would gladly have recommended, that a premium be awarded for his crop of barley; but the regulation of the society requires that the experiment made on each of the "grain crops," excepting wheat, should be on not *less* than *one acre* of land.

Henry Robinson, of Needham, raised 18 bushels of spring rye on one acre, and Hiram W. Jones, of Dover, 16 bushels of winter rye. Mr. Jones's statement on this subject, as is also his statement upon his crops of corn and oats, is full and satisfactory. But as winter rye ordinarily yields considerably more than spring, the committee are of opinion, that the society's premium of six dollars should be awarded to Mr. Robinson.

William Pierce, of Needham, raised 100 bushels of corn on an acre, and Hiram W. Jones, of Dover, 70 bushels on an acre. From the statements of these gentlemen, it will appear that

both of them estimate their land at the same value, viz., $60 per acre. Your committee recommend, that the premium of ten dollars be awarded to Mr. Pierce, and the premium of six dollars, to Mr. Jones. The last named gentleman raised 105 bushels of oats on 3½ acres. We recommend that the premium of six dollars be given him for his crop of oats.

Your committee are unwilling to close their report, without expressing the satisfaction they feel, on account of the increased interest manifested in the "grain crops" in our county. The opinion has been more or less extensively entertained, that the cultivation of these crops in this country is unprofitable. There may be parts of the county in which, on account of the *high price* of the land, this may be correct. But where the price of the land, suitable for these crops, ranges from 50 to 75 dollars per acre, it is believed that these grains, cultivated with skill and care, may afford a handsome remunerating profit. This opinion appears to your committee to be well sustained by facts familiar to the intelligent farmers in the southern and western parts of this county. It is confirmed by the statements appended to this report. The statements of Mr. Jones are satisfactory on this point. They appear to be made with fairness and accuracy. From these statements, it appears that the profit on the corn crop was 75 per cent.; that is, the value of the corn raised, was 75 per cent. over and above the cost of production. This appears a handsome profit; a profit which mechanics, manufacturers and merchants, would be glad to realize. But large as this profit appears, the profit on Mr. Jones's crop of rye and oats was still larger, being at least 100 per cent. It will be remembered, too, that the past season has not, in this vicinity, been favorable to the grain crops. A part of the season was very wet, a part very dry, and most of it colder than usual. The crops of grain were generally lighter than in common years; and still, notwithstanding these unfavorable circumstances, the grain crops in our county, that have been cultivated with skill and care, have yielded a handsome remunerating profit. Your committee regret very much, that there has been so *great delay* on the part of the claimants in sending written statements to them. They have suffered

much inconvenience from this cause. It is very desirable that all committees should have in good season, the *facts* upon which their reports are based, that thus they may have sufficient time to form their opinions deliberately, and make out their reports with care. Unless opinions and reports rest upon such a basis, they are of comparatively little value.

Your committee, therefore, in closing their report, urgently recommend the adoption and enforcement of the following regulation, to wit:—That every person who puts in a claim for a premium on any of the "grain crops," shall, on or before the 15th of November each year, send to the chairman of the committee on the aforesaid crops, a written statement, containing, besides any other suggestions that he may make, the following particulars, viz.:—a description of the soil; the value of the land; the annual interest on that value; the amount of taxes; the value of manure, or ashes, or plaster used; the cost of seed; the expense of preparing the ground; of sowing or planting; of cultivating and harvesting the crop; and the total value of the crop raised; that thus, by a single glance, the net cost of the production may be seen.

RALPH SANGER, *Chairman.*

Horatio Mason's Statement on Barley.

The field of barley which I entered for premium, contains 150 rods. Corn last year, with a light dressing of hog manure. This spring, the land was ploughed and spread with 10 loads green manure, and ploughed in. Sowed 1¾ bushels of barley, and harrowed in. The product, 37½ bushels. Barley has been a favorite crop, but for the last ten years, it has not succeeded as well as formerly. Last year I sowed a little, with a determination to abandon it altogether if there was no improvement. I had a better crop than in the last six or eight years, and this year the crop was a good one. The land was flat, the spring wet, and the ground in bad order; so much so, that the grain was not sowed until the last of May (about a month too late) I consider barley the best crop to lay down land with. It is also a good substitute for corn, in fattening beef and pork, and much easier raised.

I have charged for two ploughings, $2 50; sowing and harrowing, 1 25, - - - -	$3 75
do. land worth $60 per acre, 3 60; taxes, .50, -	4 10
do. threshing, $3 50; ten loads manure, 5 00, -	8 50
do. mowing, raking, and carting, $3 00; 1¾ bushels seed, 1 75, - - - -	4 75
	$21 10
Cr. by 37½ bushels barley, at 75 cts. per bushel, -	$28 13

E. Medway, *Nov.*, 1851.

Horatio Mason's Statement on Wheat.

The wheat field which you viewed in July last, contains 180 rods. The soil is a gravelly loam, planted with corn the last year, with a dressing of twelve loads of green manure.

This spring the ground was ploughed, and about the same quantity and quality of manure spread as last year, and ploughed in. The land was then divided into two equal parts. One half the seed was thoroughly soaked in lime water, then mixed with plaster and ashes, and sown upon one half the ground. The other half was sown at the same time with dry seed, and the whole harrowed in. There was no perceptible difference in the grain, where the seed was soaked and where it was sown dry. Sowed the first week in May, 1¾ bushels—gathered in July—threshed in September.

Product, twenty-five bushels. Weight, sixty pounds per bushel. Land worth $75 per acre.

I have charged for use of land, and taxes, - -	$6 75
" " " two ploughings, - - -	3 00
" " " sowing and harrowing, - -	1 25
" " " one half, twelve loads manure, -	6 00
" " " reaping, binding, &c., - -	3 75
" " " threshing 25 bush., 12½ cts. per bush.,	3 13
" " " 1¾ bushels seed, at $1 50 per bush.,	2 62
Making the sum of -	$26 50
Cr. by 25 bushels wheat, at $1 33 per bushel,	$33 25

E. Medway, *Nov.*, 1851.

Hiram W. Jones's Statement on Rye.

The crop of rye offered by me for premium, was grown upon an acre of light, sandy loam, which had been sown with grass two years previous, but not become thickly swarded. It was ploughed the last of September, 1850, rolled, harrowed, sowed with one and one quarter bushels of seed, then thoroughly harrowed and rolled. It was harvested the 19th of July.

The expense of the crop, was

For ploughing, - - - - -	$1 50
Harrowing twice, $1 00; seed, 1 25, - -	2 25
Rolling twice, - - - - -	75
Harvesting, - - - - -	1 50
Threshing and winnowing, - - -	2 50
Interest on value of land, - - -	1 80
Taxes, - - - - - -	17
Total, - -	$10 47

Value of Crop.

For 16 bushels rye, at $1 00 per bushel, -	$16 00
For 1320 lbs. straw, at .95 per hundred, -	5 94
Total, - -	$21 94
Balance, -	10 47
	$11 47

Dover, *Dec.* 1, 1851.

Horatio W. Jones's Statement on Oats.

The field of oats entered by me for premium, contains about five acres, and was planted with corn in 1849 and 1850. An unusual quantity of rain having fallen the last season, and a part of the field being low, the crop of corn was not large. Last spring I commenced ploughing as soon as the highest part was dry enough, (the first of May,) and sowed about an

acre. I was then obliged to leave it, on account of the water, until after planting. June 1st, it still was very wet, but I succeeded in getting it all sown with oats and grass seed. $2\frac{3}{4}$ bushels oats, one peck herdsgrass, one bushel northern red-top clover, (six pounds) were sown to the acre. It was thoroughly harrowed in, and then rolled. The season continuing very wet, very few of the oats sown on the low parts came up. Those sown on the higher parts, came up and grew very well. One third of the field, at least, was so injured by the water, that it was cut when green for hay, or reserved to feed out without threshing. This left three and one third acres to be cut and threshed. After threshing, the oats measured one hundred and five bushels. The seed oats were of the variety known as the Bedford oats, which are less subject to blast, than any other variety with which I am acquainted. The expense of the crop, was as follows:

Ploughing, harrowing, sowing, and rolling $3\frac{1}{3}$ acres, at $2 50 per acre,	$8 33
Interest on value of land,	10 00
Taxes,	73
Harvesting,	4 16
Threshing, by horse power, and winnowing,	6 00
Nine bushels seed, at 55 cents,	5 95
Total,	$35 17

The value of the crop, was,

For 105 bushels, at 55 cents,	57 75
" $2\frac{1}{2}$ tons straw, at $7 00,	17 50
Total,	$75 25
Balance,	35 17
	$40 08

Dover, *Dec.* 1, 1851.

Horatio W. Jones's Statement on Corn.

The acre of corn, for which I ask a premium, was improved as a corn-field the last year. There had been no manure put

upon it for several years. The soil is a gravelly loam, (not very rich,) situated upon a hill side, and well adapted to the growth of corn. In May of 1850, the sward was ploughed, harrowed and manured in the hill only, and planted with corn. It yielded a fair crop in the fall. Last spring it was ploughed twice, harrowed once, and furrowed one way; the furrows three and one half feet apart. On the 14th and 15th days of May, thirty-two horse-cart loads of compost manure, (twenty bushels each,) one half of which was horse manure, the other loam, (the whole having been thoroughly mixed in the barn cellar,) were carried on and put, a shovelful in a place, about three and one third feet apart in the furrows, making four thousand hills to the acre. It was then planted with a medium sized, very early variety of corn, putting five kernels in a hill. This corn I obtained from Acton, Mass., last winter. The cultivator was used between the rows once, and the plough twice, during June, and it was hoed three times. The top stalks were cut the first of September, and the corn was ripe enough to harvest the first of October. The expense of the crop was as follows, viz.:

Interest on land, at price paid for it in May, 1850, -	$3 60
Taxes, - - - - - -	30
Ploughing, harrowing, and furrowing, - -	4 50
Applying manure, $3 00; one half the manure, 10 67,	13 67
Working with cultivator and plough, - -	2 00
Hoeing, three times, $4 00; seed, 25, - -	4 25
Cutting and securing top stalks, - - -	1 50
Harvesting corn, - - - - -	7 00
Total, -	$36 82

On the 25th of October, the ears from twenty-five hills, that being the average upon a square rod, were gathered and weighed.

Nov. 8, the ears weighed - - -	31½ lbs.
Dec. 1, " cobs " - - -	5 lbs.
The shelled corn measured - - -	17 qts.
" " " weighed - - -	25⅛ lbs.

Making seventy bushels of shelled corn to the acre.

The value of the crop was as follows, viz.:

70 bushels, at 92 cents,	$64 40
Top stalks,	3 25
Husks,	7 00
Total,	$74 65
Deducting cost of crop,	36 82
Leaves net profit of,	$37 83

Cost of corn per bushel, $52\frac{2}{10}$ cents.

Dover, *Dec.* 1, 1851.

Henry Robinson's Statement.

The field is one acre—a warm, dry soil. Stocked with fruit. Some of the trees in bearing order; most of them, however, but four years from the bud. Has been under cultivation four years. Planted first with potatoes, and the two succeeding years with corn. This year, with rye. Have given it a thin coating of manure each year,—say three cords. Sowed in the spring one bushel and a half of rye, and threshed eighteen bushels this fall. The statement is this, therefore:

Ground,	1 acre.
Seed,	$1\frac{1}{2}$ bushel.
Manure,	3 cords.
Grain,	18 bushels.

Needham, *Nov.* 25, 1851.

William Pierce's Statement.

The quantity of land on which my corn was raised, measured two acres. In the spring of 1850, this land was turned over, and planted with corn and potatoes; manured with compost, putting one shovelful in the hill. The compost was composed of mud, loam, and green manure, composted in the barn-yard the previous summer.

In the spring of 1851, I ploughed this land two inches deeper than the year previous, (ploughed eight inches deep.)

Upon one acre, composed of black, sandy loam, I spread *six* loads of green manure, twenty-five to thirty bushels to the load, harrowed *well*, furrowed with plough one way, three feet apart, applied one shovelful of manure in the hill, 2½ feet apart in the row; this manure was a compost of mud, loam, night soil, and green manure, thoroughly composted. The corn was planted on the 16th and 17th of May, putting four or five kernels in the hill; hoed twice. Harvested 1st of November. One rod was selected, which was considered a fair sample of the acre. This rod yielded twenty quarts of shelled corn. To the additional acre, a lighter sandy loam, I applied *four* loads of green manure. In other respects, the two lots had precisely similar treatment, and the yield was obtained in a like manner, one rod yielding sixteen quarts, one pint.

Value of land, per acre, $60. Taxes, 45 cents on $100.

Needham, 1851.

Root Crops.

There was awarded to Elijah Perry, Jr., of Dover, for the best field of carrots, the premium of $6.

Elijah Perry, Jr.'s Statement.

The ground on which I raised my carrots, which I offer for premium, measures one-half acre, one and six-tenths rods. It was in carrots last year. After gathering the carrots, I spread six horse-cart loads of compost manure, ploughed it in, and let it lie till spring, when I spread seven horse-cart loads more of compost manure, and ploughed it in. I ploughed the ground twice, and harrowed it once in the spring. On the 18th day of May, I ploughed it into ridges, about twenty-eight inches apart, and sowed by hand, one row to the ridge. This work was done by two men and a horse, in a little more than half of a day. The first weeding was done with a garden hoe, as soon as the carrots could be distinguished from the weeds. The second time, I run a cultivator between the rows and thinned the carrots, and the third time, I did not intend to

leave the carrots nearer than seven inches, and from that to six inches apart. After this, the cultivator was run through the rows once, and a little work was done with a hoe. Where the carrot seed did not come up well, I sowed ruta baga seed at the second weeding. The dry weather seemed at one time to stop the growth, but after the rains came, they started and grew well.

I had 10,095 lbs. of carrots—5 tons, 95 lbs.—or 180 bushels and 15 lbs., estimating 56 lbs. to the bushel; and I raised on the same ground where the carrots did not come up, 2,550 lbs. ruta bagas. I have sold one ton of ruta bagas at $8 per ton, and about one half the carrots at $10 per ton. At these prices, the carrots would amount to - - - $50 50

Ruta bagas, - - - - - 10 20

$60 70

The expense of ploughing and harrowing,	$1 25	
" " " sowing, - -	1 50	
" " " first weeding, - -	1 00	
" " " second " - -	1 25	
" " " third " - -	1 25	
" " " cultivating and hoeing,	1 00	
" " " harvesting, - -	2 75	
I charge for manure, - - -	13 00	
		23 00
Net profit, - - - -		$37 70

I have charged nothing for the fall ploughing; nor getting the manure on the land, supposing that the land might be enough better to pay for the work; nor have I charged for the use of the land, choosing to let others make their own estimate. I have raised carrots on a small portion of this land three years, and my opinion is, that they grow quite as well the second or third year as the first.

Dover, *Nov.* 14, 1851.

Agricultural Implements.

There are in the county, manufactories of hoes and forks, producing, it is believed, the best articles of the kind in the world. Not a single article of Norfolk county manufacture was entered for exhibition. This is, probably, partly owing to the fact referred to in our report last year, that the articles exhibited the previous year, received no notice from the committee; but perhaps more to the fact, that the society is understood to offer premiums only for "new agricultural implements;" that is, for new inventions. The committee suggest that this restriction upon the action of the committee for the next year, be removed. The society offer premiums for the *best* fruits, the *best* vegetables, without requiring that they should be *new* varieties. The offer of premiums for the *best* agricultural implements, would undoubtedly invite competition and secure a fuller exhibition. It is hardly creditable, that an exhibition, second to that of hardly any county in the State for agricultural products, should be entirely without agricultural implements. The only exhibitors in this department, were Messrs. Prouty & Mears; and the articles entered, were two hay-cutters, two churns, one cultivator, and three ploughs.

F. W. BIRD, *Chairman.*

PLYMOUTH COUNTY AGRICULTURAL SOCIETY.

The annual festival of the farmers of this county came off at Bridgewater, on Wednesday, the 8th of October last. The first feature in the exhibition of the day, was the ploughing match, which took place at 9 o'clock in the morning. There were twenty-six teams, of one pair of oxen each, entered. The contest was very spirited and the work was performed in a most skilful manner. The committee recommend that for the future every ploughman should drive his own team, and that all who wish may strike out their own lands, with an additional compensation therefor. As the object is to do work not only well but cheap, it is thought that the premiums should be so graduated, as to encourage and reward the man that drives his own team.

The trial of working oxen took place on the hill opposite the Unitarian church. Thirty-two teams were entered. The test of superiority was the drawing of a load of about 5000 pounds, up the hill and back.

There were twenty fat oxen offered for premium. One pair was exhibited by Abraham T. Low, weighing 4200 pounds, and a pair by Augustus Pratt, of Middleborough, weighing 3360 pounds. The number of entries of milch cows and heifers was much larger than that of former years, and superior in quality. Of horses and colts, but few specimens were exhibited.

The display of dairy products, and of fruits and vegetables, was unusually large and excellent.

The address was delivered by James E. Teschemacher, Esq., of Boston.

On Improvements.

The committee on improvements can at this time only report on two classes of premiums offered some years since.

In 1848, three prospective premiums were offered "to the person who shall do the most effectual work with the plough or hoe in subduing bushes in pasture land from May, 1848, to October, 1851."

For those premiums, three entries were seasonably made; one was subsequently withdrawn.

The committee recommend the award of the first premium of $10 to Chipman Porter, of Halifax, he having effectually subdued six acres of bush pasture at an expense of about $10 per acre.

Austin J. Roberts, of Middleborough, has partially reclaimed four acres of very rough land at a great expense, but we apprehend that the trustees in offering those premiums, did not contemplate bestowing them on competitors who should attempt the renovation of pasture land at an expense of $50 or $60 per acre; there are few localities in the county that would justify so great an outlay, unless there were some very visible evidences of fertility.

It is to be feared that applicants for those premiums in their eagerness to become successful competitors, may sometimes, (from a misconception of their interest,) destroy much young growing wood, which in a few years would become vastly more valuable than indifferent pasture land.

Three prospective premiums were offered in 1848, "for the most judiciously cultivated farm of not less than twenty acres," payable in 1851. Three entries were originally made, two have since been withdrawn, leaving Orsamus Littlejohn, of Middleborough, without a competitor.

It is a matter of regret, that when there are so many farms in the county of Plymouth that should merit this distinction, so few competitors should be found. We recommend the award of the 2d premium of $20 to Mr. Littlejohn.

Mr. Littlejohn combines the two-fold occupation of farmer and blacksmith, and owns a farm of fifty-six acres, twenty-two acres of wood land, twelve acres of unimproved, and twenty-two acres of improved land. The appearance of his farm when divested of crops is certainly not very prepossessing; the most of his soil may very properly be denominated what

he terms it, "*hungry*," and exhibits evidences that the former owners were not very liberal in supplying *all* the food necessary for the full development of growing plants.

Since it come into his possession, Mr. Littlejohn has converted several acres of worthless swamp into fertile English meadow.

His unimproved land, he has mostly covered (by planting) with young thrifty forest trees.

His orchard contains one hundred and thirty-eight trees of various kinds, in a flourishing condition, the most of them set or grafted with his own hands.

For his sandy and gravelly soils he prepares annually a compost of muck (composed chiefly of vegetable matter) to which he adds, barn-manure, burnt oyster shells, spent ley, ashes, &c., by which he obtains a most fertilizing manure, suited to his soil, at the trifling cost of twenty cents per load.

Mr. Littlejohn has erected the present season a new and convenient dwelling-house, one room in which he informed us would be fitted up for an agricultural library, from which may emerge, at no distant day, another "learned blacksmith."

In the management of his farm we have discovered no hasty or impulsive attempt at renovation not justified by the strictest economy, but a system of progressive improvement, exhibiting a degree of prudence and economy seldom equalled and never surpassed.

Respectfully submitted,

HORACE COLLAMORE.

Chipman Porter's Statement.

The bush pasture that I have entered for premium, I purchased in April, 1848. I commenced cutting bushes the August following, and ploughed two acres; in 1849, two acres more, and in 1850, two more, making six acres that I ploughed. The most of it had not been ploughed for forty years. It was covered with black and swamp whortleberry, black laurel and bayberry bushes. I seeded it down to grass in April, and it took well. The bushes are nearly all subdued but the laurel; they start between the furrows. The expense of cutting the

bushes and ploughing has been about ten dollars per acre. One other acre of meadow land was covered with alder and rose bushes. This I subdued by cutting in August; there were but few of them that started; those that did, I cut the next year and it entirely subdued them.

HALIFAX, *Sept.* 6, 1851.

Orsamus Littlejohn's Statement.

The offer of a premium made by this society, for the most judiciously cultivated farm of not less than twenty acres, payable in 1851, was accepted by me in 1848, and the following is an account of my operations and the results.

I am a blacksmith by trade, and my time is almost wholly occupied in the shop; when on the farm, I charge ten cents the hour. My farm, which by the help of books, I have earned and made, contains 56 acres and cost $1,483. 22 acres are wood land—12 acres are too poor to have a name, and have been planted with forest trees—22 acres are the farm. My stock is equal to three cows, one horse, three hogs and one beef creature. My family consists of seven persons. A daily account has been kept with the farm, and also of all the articles bought for the family. Each crop is charged for all it receives, and credited for all it returns. The labor and materials not produced for the compost heap, are charged.

Permanent improvements, such as blasting rocks, building walls, shifting soils and laying under-drains are charged to improvements.

The hired labor in 1848, amounted to - -	$135 50
Interest on farm and taxes, - - -	104 00
My work and boys on farm, - - -	50 00
Articles purchased for farm and family, such as stock, hay, grains, groceries, grass seed, repairs on buildings, pasture, stock, materials for compost,	142 98
	$432 49
Produce of the farm in 1848 as follows:	
135 bushels corn, 75 cts., - - - -	101 25

Corn fodder, $22 50,—100 bushels potatoes, 50 00,	$72 50
35 bushels oats, $14 70,—straw, 5 00,—garden vegetables, 11 00,	30 70
10 3-4 tons English hay, at $13 per ton,	138 67
Hay seed, and pasture for three cows and a beef creature,	30 70
88 bushels carrots, sold for 33 cts.,	29 04
200 bushels of fruit of all kinds,	42 00
104 bushels French turnips, $16 92,—3 bushels beans, $6 00,	22 92
24 bushels rye and wheat, $13 50,—straw, $4,	17 50
372 loads compost manure, (30 cubic feet) 1 ct. per foot,	111 60
Permanent improvements,	47 50
Estimated growth of wood,	45 00
House rent, $30,—received for bees and honey, $7 00,	37 00
Amount of sales, of surplus beef, pork, butter, cheese, eggs, milk, and for exchange of stock and premiums,	267 85
	$994 03
Deduct expenses as above, for farm and family,	432 49
Net profit,	$561 54
In 1849, the income of farm was,	$1036 15
Expenses,	453 84
Net profit,	$582 31
In 1850, the income of farm was	$1075 55
Expenses,	464 74
Net profit,	$610 81
In 1851, the income of the farm was estimated at	$1150 24
Expenses,	339 32
Net profit,	$810 92

I have made no account of fuel, for the premises afford an abundance of birch, alders and refuse wood, that pays well for collecting. The cultivation of crops, the manufacture of compost manure, &c., are all charged the market price of day labor, that they may not appear low in consequence of cheaper labor by the season. 1377 loads of compost made in the above named four years, cost 20 cents per load. My yards and barn cellar, are kept well supplied with mud, shoveled out the year before.

Much pains are taken to save all the liquids made on the premises. My compost heaps are made by first placing a layer of mud, then about one-third as much barn manure, and so on, alternately, with the addition of salt, ashes, burnt oyster shells, salt ley, &c., and wet over with water. After fermentation takes place, it is shoveled over and used as wanted. It is always applied on top of the ground, prepared for crops, and kept there as much as possible.

Since I entered for this premium, I have raised 488 bushels of corn, at a cost of twenty-one cents per bushel. Sward land is taken for this crop. I plough seven or eight inches deep, when the ground is as dry as possible. Spread from forty to sixty loads of compost on the acre; harrow, brush and hoard over, till all is fine and smooth; plant three and a half feet apart, each way. Five or six corns are dropped in the hill, six inches apart; one quart of fine compost is spread on the corn, and covered lightly. The cultivator is used one week and the hoe the next, until the corn shades the ground sufficiently to keep the weeds down, and the ground loose; in this way, myself and two boys have hoed one acre in two hours.

I select my seed corn in the field, about the 10th of September; ears that are then ripe, close to the ground, and on small stalks.

There has been about fifty-one tons of English hay raised on my farm, the last four years, at a cost of a fraction over four dollars per ton. My hay and pasture crops have nearly doubled since 1848. My reclaimed meadows are kept in tolerably good condition. By spreading one load of manure every fall, over a large surface, and three or four loads of gravel on the manure, the old turf decomposes and enriches the land.

There has been 488 bushels of potatoes raised, at a cost of twenty-seven cents per bushel. I have suffered very little by the rot. I plant early—early seed,—manure highly, and dig early.

This crop is cultivated almost wholly with the horse. I cover with a bush, and when the potatoes are up, run the cultivator close enough to cover the tops and weeds; do the same again if possible, and finish with the hoe. I have raised forty-four bushels of winter wheat, at a cost of eighty-five cents per bushel; this crop was put in after potatoes, with grass seed—the grass was a very great damage to the crop.

Ninety-three bushels of winter wheat and rye, mixed, have been raised, at a cost of sixty-seven and a half cents per bushel. This crop was raised on very poor land; got in about the 1st of September, with a light dressing of compost manure.

Oats and white beans have cost their market value.

There have been about 700 bushels of fruit raised, mostly apples, at a cost of six and a half cents per bushel. I have 238 fruit trees in all, the most of them set or grafted with my own hands. During the warm weather in January, I wash or soap the trees as near the top as possible, with a whitewash brush; the after-rains wash the soap down and kill the insects. The trunks are scraped in the spring, and pruned just before the blossom buds open, and again in August. The ground is kept dry round the trees, and compost applied over the whole ground, late in the fall of every other year. This crop can scarcely be estimated too highly as food for man or beast.

My cattle have each, once a day in the winter, about a bushel of cut straw or stalks, moistened and mixed with one or two quarts of cob meal or shorts, or have carrots or turnips. They thrive well on either; and I consider it equal to an insurance on their lives.

It will be seen that a living has been received from the farm for the family, and a balance for education and the pursuits of happiness.

Middleborough, *Sept.* 9, 1851.

Supervisor's Report.

We cultivate the soil that received the first impress from the footsteps of the hardy pioneers, who landed on our shores more than two hundred years ago. They found fields then cleared and cultivated with maize or Indian corn, (a grain unknown to Europeans till the discovery of this continent); in the process of time, those fields became exhausted of fertilizing material, and a resort was had by the natives of the soil to the rivers and ponds, at certain seasons of the year, for alewives and other fish, to restore to the soil its primitive productiveness. Unskilled in the arts of husbandry adapted to the New World, our progenitors followed in the footsteps of their savage tutors,—cleared the land most easily cultivated, and which, from the nature of the soil, was the more readily exhausted; the silicious virgin soil, rich in accumulated vegetable matter, for a while withstood the heavy drafts, but as generation succeeded generation, and pursued the same course, and cultivated the same fields with cereal grains, without any adequate returns of fertilizing manure, their crops began to fail, the paternal acres were abandoned by enterprising youth, and new locations sought in the western wilds.

Little was done for the amelioration of the soil in this county, prior to the organization of this society, some thirty years ago. Since then, our progress has been onward; prior to that time, little attention was paid to the renovation of low meadow or swamp lands, which have so liberally rewarded the labors of the husbandman, with large crops of rich herbage.

Little was done in the manufacture of compost manure, an article so necessary to restore to our exhausted fields their wonted fertility.

Little was done in the judicious alternation of crops, a system so necessary for the amelioration of the soil.

It is their boast that the agriculture of England has doubled its products within the last half century. We would make no invidious comparisons, but we claim for Plymouth county a much greater increase in the productions of her soil.

It has been said we have no agricultural science in America; that for this commodity, we are dependent upon Europe.

If we, of the old colony, can make little pretensions to the science of agriculture, (literally speaking,) we claim at least, the virtues of industry and economy, and we have learned something of the economy of making and saving manure, and of its judicious application to the soil—of crops judiciously arranged and suited to the soil; and we have some practical skill in the cultivation of crops, that compare favorably with any raised in the United States. If then, as has been truly remarked, "in the first stages of civilization, art precedes, science follows," reasoning from analogy, may we not consider ourselves in a fair way to attain (at no very distant day) a sprinkling of old colony agricultural science? And as this will be applicable to our soil, perhaps it may not then be necessary to continue the importation.

Competitors for premiums the present season, exceed in numbers those of former years. More than eighty entries were seasonably made, and your supervisor, in the discharge of his duties, has visited the fields entered for premiums, three times; in doing this, he has travelled some four hundred miles.

Seven claims were originally entered for the greatest crop of Indian corn on one acre.

After a season of excessive moisture, and notwithstanding the trustees, at their last annual meeting, saw fit to raise the standard of computation to eighty-five pounds of corn in the ear, for a bushel, yet we think the number of bushels raised on the acre this season, will compare favorably with former years.

Seth Sprague, of Duxbury, is entitled to the first premium of eight dollars. He raised, according to measurement, $101\frac{55}{85}$ bushels on an acre. This crop was raised on a sandy soil, bearing incontrovertible evidence that it was once the site of Indian wigwams, and that the tribe was accustomed to banquet on clam chowder, and it would require no very great stretch of the imagination to carry us back to the time, when on this spot, the old sachems and their tribes were wont to assemble around the council fires, to smoke the pipe of peace,—to hold their pow-wows or perform the war dance.

Spencer Leonard, Jr., of Bridgewater, is entitled to the second premium of six dollars. He raised 98$\frac{70}{100}$ bushels.

Benjamin Hobart, of Abington, is entitled to the third premium of five dollars. He raised 91$\frac{55}{100}$ bushels.

Four claims were entered for the best field of Indian corn, not less than two acres.

Seth Sprague, of Duxbury, raised 98$\frac{70}{100}$ bushels per acre, and is entitled to the premium of ten dollars.

A gratuity of five dollars is recommended to be paid to Leonard Hill, of East Bridgewater, who raised (under many disadvantages and inconveniences) 88$\frac{40}{100}$ bushels per acre.

Five claims were originally made for the best field of Indian corn, not less than three acres.

Adin Alger, of Bridgewater, is entitled to the premium of fifteen dollars. He raised 67$\frac{65}{100}$ bushels per acre.

Six claims were entered for the best experiment to prove the influence of subsoiling on the corn crop; three subsequently withdrew.

Benjamin Hobart, of Abington, is entitled to the premium of five dollars; the difference in favor of the subsoiled part, is 11$\frac{65}{100}$ bushels per acre.

Spencer Leonard, Jr., of Bridgewater; difference in favor of subsoiling, 10$\frac{30}{100}$ bushels per acre—one volume Massachusetts Ploughman.

Notwithstanding the season was unfavorable for experiments in subsoiling, in consequence of the abundance of moisture, yet sufficient influence is shown in every instance, to encourage further experiments.

B. Hobart, of Abington, entered for premium for the best experiment to prove the influence of subsoiling on the wheat crop. The half acre subsoiled, exhibited the most luxuriant appearance through the season, and so rapid was its growth, that the high winds caused it to lodge before the grain was matured, which occasioned considerable loss of grain; owing to these circumstances he obtained about a bushel more from the part not subsoiled. Notwithstanding these adverse circumstances, we think he is entitled to the premium of five dollars.

For the best experiment in raising oats, Sylvanus Hinckley,

of Middleborough, is entitled to the first premium of eight dollars,—he raised 62¾ bushels on an acre.

George W. Wood, of Middleborough, the second premium of six dollars,—he raised fifty-one bushels and twelve quarts on 158 rods of land.

A gratuity of three dollars to Leonard Hill, who raised fifty-one bushels on the acre.

For the best experiment in raising wheat, Benjamin Hobart, of Abington, is entitled to the first premium of fifteen dollars,—he raised twenty-four and a half bushels on an acre. Mr. Hobart may be considered one of the most successful cultivators of the wheat crop in the county, notwithstanding he persists in the doubtful expediency of applying manure directly to the crop.

Thomas Ames, of West Bridgewater, is entitled to the first premium of eight dollars, for the best experiment in raising barley,—he raised forty-four bushels on an acre and two rods.

For the best crop of Ruta-baga or French turnips, on one half acre, George Drew, of Halifax, is entitled to the first premium of five dollars,—he raised 199$\frac{46}{56}$ bushels,—equal to 799$\frac{17}{56}$ bushels on the acre.

Seth Sprague is entitled to the second premium of three dollars—he raised at the rate of 780 bushels to the acre.

For the greatest quantity of common turnips, raised on half an acre, Aretas Fobes, of Bridgewater, is entitled to the premium of five dollars,—he raised at the rate of 448$\frac{32}{56}$ bushels per acre.

If we could divest ourselves of an "overweening fondness for English agriculture," we think the cultivation of turnips as a field crop, for fattening cattle, or for milch cows, would be abandoned in this country, for other root crops, which afford more nutriment and are as easily cultivated; for it is a fact that cannot be disguised, that the influence of this crop on the soil, is fatal to the corn crop that succeeds it.

Seth Sprague, of Duxbury, is entitled to the premium of five dollars, for raising 407$\frac{8}{56}$ bushels of beets on a quarter of an acre, equal to 1628$\frac{32}{56}$ bushels on the acre,—it is believed this is one of the largest crops of beets ever raised in this country; these, also, were raised on the land formerly occupied by Indian wigwams.

Four claims were entered for the greatest quantity of carrots, raised on a quarter of an acre of land.

Seth Sprague raised $214\frac{26}{56}$ bushels on quarter of an acre, equal to $857\frac{48}{56}$ per acre, and he is entitled to the first premium of ten dollars.

Jonathan Copeland, of W. Bridgewater, is entitled to the second premium of five dollars,—he raised at the rate of $757\frac{8}{56}$ per acre.

This is one of the richest and most valuable root crops raised by the farmer. Its nutritious qualities render it second, only, to the grain crops, as food for animals, and it is raised as easily and in as great profusion as any of the root crops.

For the first time, perhaps, in the annals of this society, we have an entry, "for the greatest quantity of onions, on not less than a quarter of an acre;" and although the applicant failed of raising the required quantity, in consequence of a failure in the greater part of the seed to vegetate, yet, he has succeeded in raising forty-five bushels of onions, and as many carrots, on the land appropriated to this crop,—we recommend that a gratuity of three dollars be paid to Aretas Fobes, for his unsuccessful attempt to raise seventy-five bushels of this delicious vegetable.

Five claims were entered for the premiums offered for the collection and judicious application of the greatest quantity of rock and other sea weeds.

Gideon Harlow, of Duxbury, is entitled to the first premium of ten dollars,—he carted 250 tons.

Seth Sprague is entitled to the second premium of six dollars. He carted 225 tons.

Five entries were made for the greatest quantity of the most valuable compost manure.

The first premium of ten dollars, is awarded to Jonathan Howard, 2d, of W. Bridgewater,—he had made 364 loads, of forty cubic feet.

The second premium of eight dollars, is awarded to Daniel Alden, of Middleborough, who made 283 loads.

The third premium of six dollars, is awarded to George W. Wood, of Middleborough,—he made 244 loads; and the fourth

premium of Colman's Report, to Austin J. Roberts, of Middleborough, who made 202 loads.

In the manufacture of compost manure, no farmer need be at a loss for material,—the sources of fertility are unlimited,—the hedgerows around his fields—peat and mud from his low meadows—afford an inexhaustible supply; in fact, *all* animal or vegetable matter, or even sawdust and spent tan, after having been used as bedding for horses or neat stock, or when divested of their acidity, by mixing with a sufficiency of barn manure, ashes or lime, to induce fermentation, are rendered an efficient manure.

It was prophetically said, by the lamented Fessenden, that "the time may come in which science may impress into the service of the cultivator, every element or substance which constitutes the globe we inhabit,—the world of matter become completely subservient to the world of mind. Then, and not till then, will agriculture have attained the utmost degree of perfection of which it is capable."

Every farmer, by a judicious application of labor, can, in a few years, render all the land he *ought to cultivate*, fertile; and it should always be borne in mind, that fertile fields draw the largest dividends from the atmosphere.* It was beautifully said by one of the earliest pioneers in modern husbandry, in this county, that "the air is composed of an infinity of gases,—of vapors exhaled from the bosom of the earth, as much more fertilizing than the more dense and earthy manures, as volatile alkali is more fertilizing than the fixed."

A rich, well cultivated soil, not only attracts moisture from the atmosphere, but it more readily imbibes and retains those life-sustaining gases, so indispensable to vegetation.

HORACE COLLAMORE.

Seth Sprague's Statement on Corn.

The acre of land entered by me for premium, on Indian corn, has been in pasture for more than thirty years, and not

* Dr. Macomber.

ploughed. About one third of it is a dark mould, of good quality; the remainder, is a light, dry, sandy soil.

In November last, from sixteen to twenty tons of kelp was carried on and turned under, seven inches deep. It was harrowed several times in April, to keep down the grass that started from the edge of the furrows. The first and second week in May, hauled on twenty loads, of forty cubic feet each, of manure, from my barn-yard, where swamp mud, peat, and other materials, had been deposited, and on which, twenty head of cattle had been wintered. This was turned under with the plough, four inches deep, and harrowed three times.

On the 14th of May, planted the Whitman corn, in rows, three feet apart; three corns in a hill, eighteen inches apart. Cultivated and hoed twice, leaving the ground level. At the first hoeing, about one gill of phospate of lime and ashes, prepared with oil of vitriol, was put around the hills, excepting about one rod across the middle of the field. There has been in no stage of its growth, any perceptible difference where this was applied, from where it was not. At the second hoeing, a handful of peat mud, in which menhaden fish had been composted the previous summer, was put around the hill.

We differ so much as to the cost of manure that we make, that I have not estimated that in the expense of the crop. Mr. Littlejohn makes it for twenty-five cents a load, while mine cost me, at least, one dollar. The cost of the droppings of my cattle, I cannot estimate.

Ploughing, $4; cross ploughing, $2; harrowing, $2; planting, $4; hoeing and cultivating twice, $10; total, $22.

Oct. 18. The supervisor gathered two rods from different parts of the field, which weighed 108 pounds, which, at 85 pounds to the bushel, is 101$\frac{5}{85}$ bushels to the acre.

The two acres entered by me for premium on Indian corn, is high, dry, sandy soil, with a subsoil of loose sand. It has been a cow pasture for about forty years in succession. During the winter and spring, I carried on to it kelp, sixteen or twenty tons to the acre. The first week in April, it was ploughed seven inches deep. Carried on thirty-six loads of forty cubic feet each of compost, from the barn-yard, where I had put, the pre-

ceding summer, a large quantity of swamp mud, peat, and other material, and on which, twenty head of cattle had been wintered. This was turned under with the plough, four inches deep,—harrowed three times. On the 15th and 16th of May, planted the Whitman corn, in rows, three feet apart: three corns in a hill, two feet apart. On one-fourth of an acre, I put about one gill of phosphate of lime and ashes in a hill, prepared as follows:—to one hundred pounds of phosphate, put forty pounds of sulphuric acid, diluted with twelve gallons of water. Stand three days, then mixed with ten bushels of ashes.

I have not been able to perceive any benefit from this application, to the stalk or ear, at any period of this growth. The whole field had a rapid and great growth of stalk, which was much heavier, and eared higher, than this variety generally does. The stalk was weak in this and my other field, and much of it fell before harvest. It was cultivated, and hoed twice. At the second hoeing, a handful of peat mud, in which menhaden fish had been composted the summer previous, was put around the hills. October 18th, the supervisor weighed two rods, taken from different parts of the field, which weighed 52½ pounds to the rod, which, at 85 pounds to the bushel, is 98$\frac{70}{85}$ bushels.

Expense—Ploughing, $8; cross ploughing, $4; harrowing, $3; planting, $10; hoeing twice, $11; cultivating, $2; total, $38.

The phosphate and ashes cost 3 75, exclusive of the labor of mixing and applying. The manure we differ in as to the value or cost of making, as well as the proportion consumed by the crop, which the most experienced can judge best. Some competitors put the ploughing of an acre at two dollars. I cannot plough an acre, with a double team and two men, for less than four dollars.

Duxbury, *Oct.* 27, 1851.

Spencer Leonard, Jr's Statement.

Having entered my name as a competitor for the premium for the greatest crop of Indian corn on an acre, I will give a

statement of the cultivation and expenses of the crop. The land was planted to corn last year and produced a heavy crop. About the middle of May this year, I spread eighty bushels of leached ashes, (cost twelve and a half cents per bushel) and about seven cords of good manure, and ploughed them in. One half was ploughed about seven or eight inches deep, and the other half was subsoiled; the plough going about ten or eleven inches deep; harrowed well and furrowed; planted the 19th of May, three feet five inches apart one way and half that distance the other, four corns in a hill. After planting, there was a medium sized teacup full of leached ashes applied to each hill. A cultivator was used between the rows, and it was hoed three times, the last time the 25th of July. The corn planted was smutty white, and was selected at the time of husking the last year's crop, care being taken to select ripe, fair, and well-filled ears. Expenses—carting and spreading manure, $7; do. ashes, $2 50; ploughing, $2 50; harrowing and furrowing, $1 50; planting, $3; cultivating and hoeing for the season, $7; seed corn 40 cents—Total, $23 90. The stalks were cut about the 20th of September. I consider the corn fodder to pay for cutting the stalks and harvesting.

Bridgewater, *Oct.* 21, 1851.

Leonard Hill's Statement.

The land I entered for the best crop of Indian corn on two acres—one acre and a half had been in grass for several years. I cut about half a ton of hay to the acre last year; the remainder was planted last year to corn. In 1851 it was planted 1st of May, I then harrowed it; 10th, furrowed it one way three feet and six inches apart, and in these furrows were put fifty horse loads, (about nine cords) of good stable and barn manure, from the pile that had been kept about four weeks; most of it was made last winter by cattle, horses, hogs, &c. On this manure I dropped three kernels in a hill, about two feet apart, using twenty-one quarts of seed. The kind was eight-rowed white (sometimes called the smutty white corn). The seed was selected last fall, from the best stalks. Planted from 11th

to 16th of May; June 10th, ploughed two furrows in a row, as near as I could to the corn and not start the roots, soon after it came up, turning the dirt from the corn, leaving a ridge several days to warm. June 20th, it was again ploughed, one furrow in a row, splitting the ridge made by the first ploughing, and then hoed leaving the ground level. July 3d and 4th, it was again hoed and weeds killed; 27th, went over with a hoe and killed the weeds that escaped the last hoeing. September 12th and 13th, cut stalks. Expense—ploughing, $5 50; harrowing and furrowing, $2 75; hauling manure, $4 75; seed, 62 cents; planting 2¼ acres, $5 25; ploughing and hoeing, $5 75; weeding, 75 cents; cutting stalks, $2 75—Total, $28 12.

East Bridgewater, *Oct.* 20, 1851.

Adin Alger's Statement.

That part of the field on which the corn grew, contains about three and one quarter acres of land. It was ploughed from greensward in the fall of 1849, and planted with potatoes the next season. I spread forty loads of manure on the lot and harrowed it in; I also used plaster on the potatoes. After the crop was taken off, the land was ploughed. The soil is principally a sandy loam. On the 1st of May, I commenced carting on barn yard manure, to the amount of eighty-four ox-cart loads, and spread it as evenly as possible on the lot. I then ploughed it six* inches deep with a pair of horses; furrowed east and west about three and a half feet apart, and planted the 15th of May. One half the piece was planted with a kind of flesh-colored corn, the other half with seed called smutty white. It was cultivated and hoed twice in June and once in July. Expenses of crop as follows—carting manure, $15; spreading do., $2; ploughing, $6; furrowing and planting, $3; hoeing, $12; cultivating, $3; five pecks seed corn, $1 25—Total, $42 25.

Bridgewater, *Oct.* 10, 1851.

* Six inches is not deep enough for any crop; eight or ten inches is the least for a premium crop.

Benjamin Hobart's Statement.

I entered my claim for a premium on one acre of wheat, and the subsoiling of one half of the same. I ploughed the ground the 15th of April, and at the same time subsoiled one half of it. On the 9th of May I spread on twenty-five ox-loads of good compost manure and ploughed it in; on the 15th of the same month, and after harrowing it, sowed two bushels of wheat, which I call golden straw wheat, and which I raised the year before, and harrowed the same in on the 16th of May, after which I sowed grass seed and bushed it over. The ground was a good loamy soil, a young orchard, on which last year I planted potatoes.

I reaped the wheat on the 21st of August, let it stand ten days in shooks in the field, then housed it, and on the 9th of September threshed it out with a horse machine. The wheat on each half acre was kept by itself, and the result was, on the half acre not subsoiled, twelve bushels and twenty-two quarts; on the half subsoiled, eleven bushels and twenty-six quarts; making a difference in favor of that not subsoiled, of over three fourths of a bushel; and twenty-four and one half bushels in all of good clean wheat. There was no rust or blast on the wheat whatever; the heads were long and well-filled. In respect to the subsoiled part, I was surprised at the result, for the half acre subsoiled was much the stoutest straw and promised the greatest yield; but I attribute the difference to the blowing down of the wheat, which was repeatedly injured in this way; the stoutest straw, the subsoiled part, did not rise so well as that which was not subsoiled, and a considerable part of it did not fill so well. It is probable that when land is under very good cultivation, that the difference of the subsoiled part over that which is not, will not be so great in the same field as in land not cultivated so high. My experience has convinced me that subsoiling is of great advantage especially in rather thin lands and hard and stiff soils.

I sowed two bushels to the acre; I used to sow two and one half to three bushels to the acre. I think three bushels too

much and two not enough. I am of the opinion that if I had sowed only one peck more I should have had thirty bushels; it would have prevented the weeds from getting the ascendancy, as they did in some spots. Two bushels and a half, or two bushels and a peck is about the right quantity to an acre; the latter quantity on rich land and the former on less cultivated land.

S. Abington, *Sept.* 27, 1851.

Sylvanus Hinckley's Statement.

The acre of land entered by me for the best crop of oats, is of a gravelly loam. I have planted it with corn two years past, by spreading on it about thirty-five loads of manure each year. Last spring I ploughed and sowed about four* bushels of oats to the acre without manure; harvested and threshed in August, and measured up sixty-two bushels and three pecks. Sowed the oats 30th day of March.

Middleborough, *Sept.* 20, 1851.

Leonard Hill's Statement.

The land on which my oats grew, the same I entered for premium, produced a heavy crop of Indian corn in 1850. Early in the spring of 1851, about the middle of April, it was ploughed deeper than usual; 18th, I sowed on to the furrows one and one half bushels of good oats and harrowed them once; afterwards sowed one and one quarter bushels oats, making two and three fourths bushels in all. Then harrowed twice, leaving the land light; I then sowed on grass seed and brushed it all over. They were cut the last of July and housed; they were threshed and cleaned the 15th and 16th of October, and we find by measuring the same, to be forty-nine bushels clean oats, two and a half bushels not so clean, making in all a fraction over fifty-one bushels. There probably would have been three or four bushels more had the season in the first part been dry as usual. About ten square rods was under water so long as to entirely spoil the whole growth of the ten rods. Expense

* Three bushels of seed is quite sufficient for an acre.—Sup.

—ploughing and harrowing, $3; seed oats, $1 42; cradling and housing, $2 42; threshing and cleaning, &c., $4 50—Total, $11 34.

East Bridgewater, *Oct.* 18, 1851.

Thomas Ames's Statement.

The land on which I have this year raised barley, was last year planted with potatoes. On the 15th of April last I ploughed the ground, and on the 26th of the same month, I spread on four cords of stable manure and ploughed it in. On the 30th, I sowed three and one half bushels of barley and harrowed it in twice. I then sowed grass seed and bushed it over. On the 20th of August, I had forty-four bushels of barley, threshed and cleaned from the ground, which measured one acre and two rods.

West Bridgewater, *Oct.* 20, 1851.

[The manure should have been applied to the previous crop. We think it a well-established fact, that barn manure should not be applied immediately to the small grains. Our own experience teaches us that two and one half bushels of seed is enough per acre—three and one half bushels quite too much. —Sup.]

Seth Sprague's Statement.

The quarter of an acre entered by me, for premium on beets, is a dark or moist quality of soil,—it was in potatoes last year. In consequence of getting a quantity of kelp and ploughing the adjoining land, it was ploughed in November, turning under about four tons of kelp. May 1, hauled on six cartloads of stable manure, and ploughed it under, six inches deep; harrowed, and carried on six loads of compost—harrowed three times. May 10th, ploughed in rows, two feet apart, in drills, (thinning out twelve inches,) one half with mangel wurtzel, and the other, the white beet of the wurtzels; not more than one-third come up. By replanting and transplanting, with four or five days' labor, I got them to stand pretty well in the rows. They were hoed four times, and hand-cultivated several times.

Labor, planting, - - - -	$2 00
Weeding, thinning, and hoeing four times,	10 00
Transplanting, - - - -	4 00
Harvesting, - - - -	3 00
Seed, - - - - -	1 00
	$20 00

On the 18th of October, the supervisor weighed one rod, 570 pounds, which, at 56 pounds to the bushel, is $407\frac{8}{56}$ bushels, and $1628\frac{32}{56}$ bushels to the acre. The white beets stood better, or nearer, in the rows, than the wurtzels, and were about equal in weight.

The quarter of an acre entered by me, for premium on turnips, was in corn last year. It is a dry, sandy soil, the subsoil loose sand. It was ploughed the first of June, without manure; spread 90 bushels of ashes, mixed with two barrels of crushed bones; harrowed fine and smooth, after adding two loads of compost manure. June 24th, planted in drills, with a seed-sower, with white French turnip, twenty inches in the rows, thinned to about twelve inches; hoed and cultivated three times.

Ploughing and harrowing, $1 50; planting, $1; hoeing three times, thinning, &c., $6; harvesting, $2; total, $10 50. October 18th, the supervisor weighed one rod, 373 pounds; 56 pounds to the bushel, is $196\frac{44}{56}$ bushels. This is a small crop; one thousand to sixteen hundred bushels should be raised to the acre, and I think premium should not be given for less than 250 bushels to the quarter of an acre.

The quarter of an acre entered by me, for premium on carrots, is a sandy, somewhat gravelly soil—it was in corn last year. It was ploughed the first of May, nine inches deep, turning under about four tons of kelp. Six loads of stable manure was then ploughed under, six inches deep; harrowed—spread six cart-loads of compost, and harrowed three times. Planted May 9th, with the orange carrot, in drills; the rows eighteen inches apart; thinned out four to ten inches apart,—there were some vacant places, but they came up well.

Ploughing twice and harrowing, $2 50; planting, $2; weeding, thinning, and hoeing four times, $12; harvesting, $4; total, (manure excepted) $20 50. On the 18th of October, the supervisor weighed one rod, 302 pounds, which, at 56 pounds to the bushel, is $218\frac{40}{56}$ bushels, or $874\frac{48}{56}$ bushels to the acre. This is a good crop, but not a great one. I intend to try for 300 bushels on a quarter of an acre, next year.

Duxbury, *Oct.* 20, 1851.

George Drew's Statement.

The land on which I planted my French turnips, was planted to corn in 1850. Ploughed in May, and cross ploughed and harrowed twice in June, $1 50. I put on the quarter acre 50 bushels leached ashes, $5 50. June 21st and 23d, planted two feet one way and twenty inches the other, $2 50. July and August, hoed twice, $3; harvesting, $2 50; making $16. I consider the land to be better for the ashes, one half the expense, $3 25. October 23d, the supervisor harvested and weighed one rod, $279\frac{3}{4}$ pounds, making $779\frac{16}{56}$ bushels per acre.

Halifax, *Oct.* 31, 1851.

Jonathan Copeland's Statement.

The quarter acre of land I entered, for premium on carrots, I ploughed the first of August, 1850; the land in good condition, and a strong sward loam, with some gravel. The middle of April, put on seven large cart-loads of manure from barn cellar, and ploughed it in deep. The 20th May, ploughed again, and commenced sowing on a smooth surface, the rows eighteen inches apart; seed of the orange variety, sown by hand. The weeding and thinning out was done by my man, before breakfast, in cloudy weather. I think it requires about the same labor to cultivate a quarter of an acre of carrots that it does to cultivate an acre of corn.

W. Bridgewater, *Oct.* 20, 1851.

Seth Sprague's Statement.

I have carted on to my farm in Duxbury, the past year, 225 tons of rock or sea-weed. A few loads were weighed, the

others estimated by them. About 160 tons I hauled from the beach, at least four miles. The remainder was brought near by water. About 100 tons were spread, 16 to 20 tons to the acre, on corn and other cultivated lands, and ploughed under, soon after as possible; a few tons were put in my barn and hog yards; the remainder was spread on my mowing land, which is a reclaimed peat swamp, drained, but moist enough to prevent it from drying up and wasting by the sun and air. I spread it as we get it, in autumn, winter, or spring. Two years ago, I spread about five tons on a little less than half an acre, which I repeated the last winter. I had this season, from that piece, more than a ton of good hay, some clover, where, two years ago, I got less than five hundred of coarse hay.

I tried it, this season, in competition with barn manure. On a quarter of an acre in my two-acre field of Indian corn, I put on the one half kelp, on the other half green manure, from my barn, in equal bulk. The corn, I think, was the best where the kelp was put. Kelp spread on low land, in autumn and winter, at the rate of fifteen or twenty tons to the acre, will increase the crop, the next season, one third. The value of this manure is so well established in the vicinity of the sea, in this region, that a premium for its application is not necessary. Every ton that lands where it can be got at, is eagerly sought for and carried off. Last autumn, I had the pleasure of seeing fifty teams on the beach at one time, and it was thought that three thousand tons were hauled up and secured on the beach in two or three days.

Duxbury, *Oct.* 29, 1851.

Jonathan Howard, 2d's, Statement.

I have made and measured, during the present season, on my farm, 375 loads* of compost manure in the following manner:—140 loads were scraped up from under and around where I had recently taken down an old barn, which had stood on the spot nearly one hundred years. This was stacked and covered with ten loads of muck. 160 loads of it were made

* 364 loads of 40 cubic feet.

in the cow yard, one fourth of which was muck, and the remainder, soil and scrapings from the sides of fences, from ditches, &c. On this I have thrown brine from meat barrels, and yarded through the season from twelve to fifteen head of cattle, the droppings from which are thrown in a heap and covered every morning with soil and coal dust, and from two to three times a week I sprinkle on the heap two quarts of salt. Fifty loads of it were made in the hog yard, where has been kept on an average five hogs. Into this yard have been thrown muck and soil, in about equal quantities and at different times, as it was needed, together with weeds and potato tops. Fifteen loads of the 375 were turf and peat ashes. The cart in which the said manure was measured, was of the following dimensions, viz., 6½ feet long, 20 inches high and 3 feet 7 inches wide, and was well filled each time.

W. Bridgewater, *Sept.* 7, 1851.

Austin J. Roberts's Statement.

I have made 202 loads valuable compost manure since March last. The amount is not so great as I have made in former years, not having so many cattle as usual.

The basis of my composts is vegetable matter from the woods near by. Decayed leaves I have collected and used with good effect, mixing them with animal manure, which I find very beneficial when applied to my fruit trees. I am led to believe, from a few experiments, that manure made in the summer and winter, is much improved in quality, by hauling it out of the pens or yards, (four to six weeks before using,) and throwing it into compost heaps, in any convenient place, or in the fields where it is to be applied, and between layers of dung one foot thick; and I put two inches of unleached ashes, and so on, proceeding until the heap is about four feet high. I have found manure thus made, almost to increase the value of the compost one half; and by thus doing, it enables the farmer to add materially to the size of the heap by mingling between the layers of "reeking dung," muck, or any other absorbent which would receive and hold any ammoniacal liquor

which might filter through the mass and various gases evolved during fermentation.

Respectfully submitted.

[This can *all* be done in the yard and save much labor.—Sup.]

Dairy Articles.

The whole number of claimants for premiums for butter was 34,—nearly all of whom complied with the requirements and submitted to the committee proper statements of their method of making butter. Those of the committee who have in former years examined butter offered for premium, are of opinion that the butter, as a whole, is not so rich and good flavored as common, owing probably to a poorer quality of feed. The butter, however, is pronounced by the committee to be of the best quality, and is, both on account of the quantity offered and the neatness and taste with which it is put up, highly creditable to the dairy women of the county. The committee have awarded the following premiums:

Mrs. Waite S. Holmes, Bridgewater,	$7 00
" Mary Whitman, West Bridgewater,	6 00
" Amasa Howard, "	5 00
" Melinda S. Holmes, Bridgewater,	4 00
Miss Selina G. Bassett, "	3 00

The number of claimants for premiums on cheese was 24. The exhibition of cheese is considered by the committee to be uncommonly good, both in quantity and quality, and is undoubtedly as good as any made in the State. The committee award the following premiums:

Mrs. Rachel Allen, Bridgewater,	$7 0
" Aretas Fobes, "	6 00
" Thomas Weston, Middleborough.	5 00
" Mary Whitman, West Bridgewater,	4 00
" Melinda S. Holmes, Bridgewater,	3 00

The committee had their attention called to a sample of bread made by Mrs. Simeon Leonard, of Bridgewater. One loaf of the wheat bread was mixed with milk, the other with water and yeast. The committee were unanimous in favor of the yeast and water, the bread being light, sweet and agreeable to the palate. The loaf of rye and Indian bread was good, being light and sweet and well baked. All this bread was made without salæratus. The committee have no premium to offer, but recommend a gratuity of $1.

CALVIN B. PRATT, *Chairman.*

BRISTOL COUNTY AGRICULTURAL SOCIETY.

The exhibition and cattle show of this society, came off at Taunton the 9th and 10th days of October last. The display in almost every department, far exceeded that of any previous year, excepting the last. The fancy articles and home manufactures reflected great credit upon the fair contributors—too much praise cannot be awarded them. The fruits were rich and rare, in size, flavor and variety. The silver plated wares, brass wares, and other articles of Taunton manufacture, enhanced the interest of the exhibition.

Of stock, there were about eighty head of cattle, viz: twelve yokes of oxen, eight bulls, ten cows, twenty heifers, ten steers and eighteen calves; together with sixteen swine and six sheep.

Ploughing with Ox Teams.

The committee (S. M. Stanley, Chairman,) reports that sixteen competitors entered their names, fifteen of whom ploughed, and the committee are happy to say that as a whole, the work was well performed; better, we think, than on any previous year. There was some difficulty experienced on the part of some of the ploughmen, in leaving the last furrow unturned, (it being the first year of trial in that respect,) which will readily be obviated by practice.

The committee were unanimous in adopting the following *rules*, which would govern them in their decision of the work, and also made the same known to the competitors before the trial.

1st. Thorough pulverization of the soil.

2d. Narrow furrows, well turned, not less than seven inches in depth.

3d. The last furrow left unturned.

4th. Unlimited time without hurrying.

In some cases, the lands were well turned, but lacked pulverization; in others, thoroughly pulverized without being well turned; some others with comparatively wide furrows, and others still, improperly finished.

The committee suggest the propriety in future, of adopting rules for the regulation of ploughing at the March meeting, and having them published under the list of premiums.

Ploughing with Horses and Steers.

The committee (F. B. Dean, Chairman) say, that the ploughmen have rendered any remarks this committee might have wished to offer, entirely unnecessary, by performing their work to the satisfaction of all, and beyond their praise. We have found it no easy task to decide who among the many rivals on the field, were most entitled to the awards.

The rules announced by the committee, before commencing, and which guided them in their decisions, were as follows, viz:—

1st. Ploughing not to be less than seven inches deep.

2d. The soil to be well pulverized.

3d. The last furrow, in the middle of the lands, to be left unturned from six to eight inches wide.

4th. Preference to be given to narrow furrows.

The whole number of teams, under the supervision of this committee, was sixteen, nine of which were composed of one yoke of two or three years old steers, one horse and driver, and seven of one span of horses without driver.

Sheep and Swine.

Though the specimens on the ground were very fine, and deserving of all praise, yet the value of the best breeds of these animals is such to the country, and especially to this part of it, where, if we make anything by such stock, it must be by having it better than that of others, that we wish many more raisers of it would bring the best they have, and make a more

exciting and severer competition. For the very competition to produce the best breed, and the best specimens of a breed, is of vastly more importance to the country, than the trifling sum offered as a premium. And we think the farmer who, by skill and care, shall produce a finer breed of domestic animals than has heretofore been known, does a benefit to the community that cannot easily be reckoned. And a comparison of them here, at our annual exhibitions, is one of the best modes of instructing the raiser of them in the points he should seek to cultivate, and the competition for prizes will spur his energies and ambition to do better than he has ever done before.

And we shall be pardoned if we add, that no breed of animals is perfect; that improvements are daily made in them; that we are just learning the rudiments of the real art of raising and improving them; that the whole field is open to every competitor; and that skill, energy and care alone will succeed.

C. B. FARNSWORTH, *Chairman.*

Cows and Heifers.

The fourth premium the committee withheld, but they recommend that the society, in lieu thereof, grant the following gratuity:—

To Horatio Leonard, Raynham, for two valuable cows, $2 00

In this case they could not award to him a premium, because the claimant had not complied with the rules of the society in his statement; the rule requiring that a statement of the amount, both of milk and butter, should be rendered; but all the milk of these cows was sold daily, and no butter made. The committee would therefore recommend the society to amend the rule, so as to authorize them to award premiums in cases of this kind.

Of heifers, there was an unusually large number exhibited. There were none of an inferior quality or grade, and nearly all of them of superior merit; of comparatively large size and of great beauty of form and color. They presented a gratifying

improvement over previous years. When they came to the examination of these beautiful and gentle animals, the committee regretted that they were restricted to the meagre premiums offered by the society. They would therefore recommend an increase in the number of premiums on heifers. In order to testify their opinion of the merits of the several animals presented, they were obliged to resort to the recommendation of several gratuities.

JOHN DAGGETT, *Chairman.*

Fat Cattle, Steers and Horses.

The committee have seen with great pleasure, the increasing interest which their agricultural brethren manifest in this branch of their industrial pursuits.

The fat cattle exceeded in numbers and quality, those which had been presented at any former exhibition of this society; and they found many of the animals so nearly equal in excellence, that it was very difficult to discriminate between them. But taking into consideration the mode of fattening, as well as the obesity of the animals, and their quality for beef, they awarded the premiums.

They also examined, with great satisfaction, a remarkable steer, only three years old, weighing 1975 pounds. This animal having been owned in the county less than three months, they had no power to award any premium. But in the hope that this steer of extraordinary promise will be preserved till he reaches maturity, the committee recommend that there be granted to his owners, A. White & Co., of Taunton, a gratuity of two dollars.

The committee regret that in the list of steers, there was a falling off from some former years. But they derive consolation from the belief that it was the only department in the whole exhibition, in which there was not a manifest improvement. The committee were reluctantly brought to the conclusion that there were no yearling steers which they could *approve* as worthy of the highest premium.

The committee were surprised to find so extraordinary an improvement in the department of horses. There was not only a very great increase in the number of entries, but a still greater improvement in the qualities of the animals. And while the committee would not encourage too great a taste for fancy animals of this kind, they will not suppress the opinion that too little attention has been given, in this county, to the breeding and raising of horses. They rejoice to see so much evidence of the increased care given to this subject, and they felt mortification and regret that so very few and meagre premiums were offered for the encouragement of the rearing of this useful and noble animal. How could the committee distribute two small premiums among twenty meritorious applicants? In this dilemma, what could the committee do, but appeal to the generosity of the society for the most liberal allowance of gratuities.

The committee entertain no doubt that, could the whole society examine the several horses, young and old, which were offered for premium, they would not only most cheerfully grant these gratuities, but feel, as the committee feel, regret that they could not make more and larger grants.

MARCUS MORTON, *Chairman.*

Ornamental and Forest Trees.

The use and cultivation of trees for ornament is not an introduction of modern times. The garden in the East was furnished with every kind of tree which was "pleasant to the sight," or good for food. There flourished in luxuriance and beauty, the

"Cedar and pine, and fir, and branching palm,"

and on every hill-side and in every valley waved

"Groves, whose rich trees wept odorous gums and balms,"

beneath whose shade our first parents sat in conversation pure, or leaned in graceful attitudes to rest. In ancient times, the

tree was the chosen emblem of life, knowledge, beauty, constancy, fruitfulness, patience, wisdom, power and victory.

The palm, the cedar, the fig, the almond, and the olive tree, were all deemed worthy of dignity and honor, while the "pine, the fir tree, and the box together," were chosen to beautify and adorn the place of the sanctuary.

And what more worthy object of admiration can be found among nature's loveliest productions, than a perfect and well formed tree—whether we behold it as a single cone, with its exact and symmetrical form, and neat trim outline, or as spreading its wide and umbrageous head in graceful lines, and sweeping curves, or bending its boughs to the earth, laden with bright and golden fruit—whether standing by itself in solitary beauty, in a fertile, grassy plain, or grouped in an affectionate and harmonious cluster with artistic grace and skill—or ranged in more formal order, by the dusty road side, refreshing the weary traveller on his sultry way, at once with nourishment and shade —whether budding forth with the fresh and joyous green of spring,—or decked in the rich and gorgeous robes of autumn, —or clad with the icy vestments of winter, glittering in the bright sun with the matchless splendor of a diamond mine—everywhere, in all places, and under every aspect, a perfect, well-formed tree is an object of beauty and admiration.

> "The sayling pine, the cedar proud and tall,
> The vine-propp elm, the poplar never dry,
> The builder oake, sole king of forests all,
> The aspine, good for staves, the cypress funerale,"

have all received the homage of a poet's pen, while the painter's pencil has vied with the sculptor's chisel in embodying and preserving their various forms of beauty and grace. The cultivation of ornamental trees is the cause and the effect, the antecedent and the consequent, the sign and the produce, of a love for the beautiful and true, in nature. It is justly entitled to be classed with the fine arts, and ever tends to elevate, humanize and refine mankind. What traveler, as he passed some humble, modest, neat-looking cottage, with its well-trimmed grass plot and overhanging elm, has not felt that *there* must be the abode of refinement, contentment and peace?

Time was, when the setting of shade trees by the road-side was forbidden by law, lest in case of fires in a village, they should be the means of spreading the conflagration from dwelling to dwelling; but thanks to a wiser, and more far-seeing legislation, their cultivation is now encouraged by statute, and their wilful and malicious destruction is visited with a heavy penalty.

A wealthy inhabitant of Middlesex recently left a legacy of several hundred dollars, for planting trees by the road-side. What future way-farer, as he seeks rest and shelter under their welcome shade, will not pronounce blessings on this benefactor of his race? A public spirited member of our own society* has directly or indirectly caused several hundred trees to be transplanted along the highways, within a few years past, and already his example is imitated by many who were first inclined to oppose or ridicule. Let us then encourage the cultivation of ornamental trees, remembering that in their happy influences upon our posterity, they will bear fruit, "some thirty, some sixty, and some an hundred fold."

This society have offered for the greatest number of ornamental trees of the best kind, and in the most thrifty condition, planted by the road-side, a premium of $10. No competitor has entered for this premium.

The cultivation of forest trees also demands our attention, and is worthy of our serious efforts. Modern civilization is fast sweeping away the beauty and pride of those noble forests, which waved so majestically over our land when the Mayflower touched our New England shores. The murderous axe of the Yankee farmer has made wanton havoc of our noble pines and stately oaks; the work of destruction is still going on, and necessity will soon compel us to adopt some energetic measures for the preservation of so valuable a production of our soil.

The beauty and usefulness of the forest are each sufficient reasons for cherishing and preserving it.

How much more pleasant to the eye is a hill-side, with its green trees and splendid foliage, to a naked barren summit

* Mr. Samuel Carpenter of Attleborough.

stript of nature's own protection? Who would exchange the tree-clad hills of Berkshire, for the uninteresting wastes of Nantucket? The lover of nature too, finds unwearied delight in gazing upon our autumnal forests. Their exceeding variety and brilliancy have been the subject of enthusiastic admiration of every English traveller. The gold and green of the American elm, the high orange hues of the sugar maple, the gold and scarlet of the swamp maple, the unassuming buffs and yellows of the birches, the full bright yellows and scarlets of the oaks, the rich browns of the bass-wood and hickories, the soft olive tints of the ash, the ochry hues of the larch, the deep black green of the firs and other evergreens, all these intermingled and combined with brilliant tints of crimson, purple and gold, in a thousand forms and shades, ever changing to the eye of the traveler, like nature's great kaleidoscope, present a sight which in gorgeous beauty out-rivals the most brilliant conceptions of imperial magnificence.

Well then does the American forest deserve preservation for its magnificent beauty alone. But we are a utilitarian people and require some more powerful stimulus to stay the devastation of our forest trees, which our want of foresight is so rapidly producing. The uses of the forest are so manifold and multiform, that our economical interest requires us to adopt some means for its preservation.

We have time to enumerate only a few of the prominent points of value and necessity. Forests enrich our soil by their annual deposits of leaves and branches. Their root and rootlets permeate the ground, opening it to the genial influences of the sun, rain and air, while on the hill-sides they bind it to the earth, preserving it from wearing and washing away under heavy rains and snows. They equalize the temperature of the climate, protecting us, our flocks and herds from the violence of the winds and the scorching rays of an American sun. They furnish us with building material for our dwellings, our shops and stores, our ships and steamers,—for our cabinet ware, carriages, wooden ware, fences and agricultural implements. To say nothing of the cultivation of certain varieties of trees for the value of their barks and nuts, the sugar maple recom-

mends itself to us as a source of easy and enormous profit. It has been stated that a single town in our Commonwealth has produced in a year over 100,000 pounds of sugar from this tree; and the annual production of a single New England State, containing not one third the population of our own, has exceeded 5,000,000 pounds, which at the average price at retail among us, amounts to a sum nearly sufficient to defray the annual expenses of the whole judiciary, executive and legislative departments of our own Commonwealth.

Last, but not least, we would mention the forest as a source of fuel. To pass over the thousands of cords consumed annually by the various railroads and steamboats, if the average supply of fuel for each family in the Commonwealth, were but 10 cords a year, and there be 150,000 families in the State, our annual fuel for family use alone, is purchased at a cost of over $7,000,000. And this does not include the vast quantities used on railroads and for manufacturing purposes, nor the thousands of tons of coal, which are annually imported and sold within our borders.

We have not time to pursue this investigation further, but enough has been given to demonstrate that the value of our forest trees is far beyond our ordinary estimation or conception.

In view of these facts, and because of the rapidity with which our woods are disappearing, this society has offered premiums for the most extensive forest of any sort of trees, suitable for fuel or timber and in the most flourishing condition in September, 1851.

The committee are gratified to see the spirit beginning to be awakened among our farmers on this subject, and that the prejudice once existing against planting trees is fast disappearing.

Many have commenced planting pines on barren worn out land, and already their fields have advanced more than five hundred per cent. in value.

The committee have examined several handsome fields of pine, in this part of the county, and award the first premium of $25 to John B. Newcomb, of Norton.

The second of $20, they award to J. Calvin Crane, of Norton.

The third of $15, to Darwin Deane, of Mansfield.

The committee have also viewed with great pleasure the pine woods of Henry T. Gilmore, of Raynham, and James Smith, of Norton, but as they are not strictly within the regulations prescribed by this society for competitors for premiums, your committee cannot award them a premium, but deem them equitably entitled to a gratuity of $10 each.

The present regulations require, that the number of trees shall be not less than 1000 to the acre. At this rate, the trees must stand not far from six feet apart. Believing that they can be raised more profitably, if more thinly planted, your committee recommend that the future premiums shall be offered to the person setting out the greatest number of acres after this date, to be not less than 300 to the acre.

EDMUND H. BENNETT, *Chairman.*

Grain Crops.

But two claims have been made for the premiums on grain crops. Both of these are for Indian corn. We recommend that the first premium of $10 be awarded to Abiah Bliss, Jr., of Rehoboth, he having raised 77 bushels on one acre. Mr. Bliss has not strictly complied with the regulations of the society, by measuring his corn between the 15th of November and 1st of December, having measured the most of it subsequent to that period. Andrew H. Hall, of Taunton, raised 68½ bushels on an acre, to whom a gratuity of $5 is recommended.

O. AMES, Jr., *Chairman.*

Abiah Bliss, Jr's Statement.

The acre of land on which I raised 77 bushels and 3 quarts of corn, is a gravelly soil, about one-third part full of fast stones or rocks. It has been mowed ten years, and no manure applied since 1846.

Ploughed first time in October, 1849. Used nine cords of manure, viz., three cords hog manure, three cords horse manure, and three cords from the winter yard, composed chiefly of

swamp mud, taken from the swamp in 1848. The manure spread evenly and harrowed, then ploughed and the land harrowed again. Furrows 3½ feet apart and three inches deep, one way; chains drawn the other way two feet apart. Six bushels of dry ashes were put in the hill—planted, 18th and 20th of May, eight quarts of eight-rowed white corn brought from Scituate, R. I. Three to four kernels in a hill, covered one inch deep. Hoed twice in June, and once in July. Used horse harrow at first hoeing, cultivator, second hoeing; the last hoeing done without the use of cultivator. The whole crop cut up and shocked the last of September; harvested first week in November.

EXPENSE OF CROP.

First ploughing with one yoke of oxen, - -	$1 25
Second " " " - -	1 25
Harrowing, - - - - - -	1 00
Nine cords manure, - - - - -	27 00
Ashes, - - - - - -	75
Planting, $2 50; hoeing three times, $6 00, - -	8 50
Cutting and shocking corn, - - - -	1 33
Harvesting, - - - - -	2 50
Seed, 25 cts.; use of land, $2 00, - - -	2 25
	$45 83
By corn fodder, - - - -	10 00
	$35 83

Rehoboth, *Dec.*, 1850.

Andrew H. Hall's Statement.

The land on which my corn grew was mowed in 1849, and yielded about seven cwt. of hay; had no manure put upon it. It was ploughed seven inches deep, and in April, 1850, there were drawn on 28 horse loads (about 20 bushels to a load) of manure, which was spread and ploughed in four inches deep. The land was furrowed but one way, averaging 4½ furrows to a rod; in these furrows was put one-third of a shovelful of fine manure at intervals of about 20 inches; used about one-

half as much as was spread. Planted, May 14th and 17th, dropping the corn on this manure, two corns at a place; used one peck of corn, it was a large yellow kind. Soon after the corn was up, ploughed two furrows in each row; about a week after, harrowed twice in a row. Hoed, June 26th and 27th, one and a half days. About first of July, harrowed again twice in a row, and the middle of the month pulled the weeds. October 24th, began to harvest; 31st, finished. There were 137 bushels of ears; several of them were weighed, averaging 38 1-2 pounds to a bushel, making 68 1-2 bushels of corn, of 77 pounds each.

EXPENSE OF THE CROP.

Ploughing,		$2 00
Manure and drawing,		36 00
Spreading and ploughing in,		1 50
Furrowing and seed,		60
Planting, 4 days' work,		4 00
Ploughing and harrowing,		1 50
Hoeing and weeding,		1 80
Cutting stalks and harvesting,		8 00
		$55 40
By 68 1-2 bushels corn, 80 cts.,	$54 80	
" corn fodder,	11 00	
		65 80
Profit,		$10 40

TAUNTON, *Dec.*, 1850.

BARNSTABLE COUNTY AGRICULTURAL SOCIETY.

The annual cattle show and fair of this society were held at Orleans, on Wednesday, 8th of October last. The exhibition of neat cattle, although good, was not so large as it should have been. The show of colts exceeded that of any former year, and it is believed, would compare favorably in numbers and quality, with that of any county in the State. The ploughing match was well contested. The fruit exhibited was of a superior character, and the articles of domestic manufacture such as were highly creditable.

The address was delivered by Hon. C. E. Potter, of Manchester, N. H.

Farms.

The committee (David Mayo, Chairman,) report, that there was but one farm entered for premiums,—the farm of Matthias Hinckley, of Barnstable. They began their examinations of this farm in May last, and continued to visit it, from time to time, until October. They think he is entitled to, and they award to him, the first premium of twelve dollars.

Matthias Hinckley's Statement.

The farm that I offer for premium, contains about twenty-five acres. I commenced purchasing in 1825, and have bought of six different individuals. The last purchase was made in 1847. The whole was in a rough, worn-out condition, nothing having been done by way of manuring, fencing, or getting out stones and rocks, for the last fifty years previous to my buying it. I have given my attention more to freeing it from rocks and clearing it up and fencing it, than to getting crops from it.

It is now mostly fenced into one acre and one and a half acre lots, with substantial stone-wall, the stone having all been taken from the ground belonging to the farm, by blasting or splitting. There is no wooden fence on the place. I have made 237 rods of stone-wall, and reset 106 rods. I have made 40 rods of blind ditches, and set 30 rods of cranberry bog, since I have owned the farm.

I commenced living on the farm in 1831, having built a house upon it during that year. The house is of the following dimensions: 25 feet front, 22 feet rear, 17 feet post, with a porch, 34 feet by 15. A shed connects the house with a barn, of the following dimensions, viz.: 20 feet by 24, and 14 feet post. In 1848, I built another barn, 32 by 28 feet and 17 feet post, with a cellar under the whole of it. I have set out about 60 fruit trees, some of which are now producing fruit, and about 100 shelter and ornamental trees. The whole farm is well cleared up and well fenced, and in good order to cultivate.

I cut annually about eight tons of English hay and about two tons of salt hay. I have about one acre of potatoes, beans and vegetables; one and a half acre of corn; one-fourth of an acre of beans, (six bushels;) one acre of rye, and three-fourths of an acre of wheat. The last named crops have not been threshed, but I judge there are 15 bushels of rye and 10 bushels of wheat. The corn looks well.

My stock is from six to twelve head. I milk generally three cows, and keep two hogs. My land is well watered by springs. A large brick cistern is attached to the barn I last built, sufficient to water stock in the yard in winter. I make about 200 horse cart-loads of dressing per year.

I have scarcely got under way at farming, as I have only been on shore about two years; but by much labor and expense I have now the farm in good condition to commence upon.

Barnstable, *Oct.*, 1851.

Grain Crops.

There was awarded to Zenas Doty, of Falmouth, for the best conducted experiment in raising Indian corn, on not less than one acre of land, the first premium, $6.

To Enoch T. Cobb, of Barnstable, for a crop of white beans, on a quarter of an acre of land, the first premium of $4.

Zenas Doty's Statement.

The acre of land, on which I have the past summer raised 76 bushels of corn, is a part of the Jenkins farm, (so called,) which cost six dollars per acre, and was good pasture land. The soil is a light, sandy loam. The manner of cultivating was as follows:—In the fall of 1850, I carted on and ploughed under, 40 loads of good stable and barn-yard manure, valued at 50 dollars. In the spring, I cross-ploughed a part of the lot, but could not see any benefit to the crop from cross-ploughing.

ESTIMATED COST OF CULTIVATION.

Ploughing, - - -	$2 50
Harrowing and planting, - -	2 90
Hoeing twice, - - -	2 50
	$7 90

The stalks of the corn paid for harvesting.

Falmouth, *Oct. 6th*, 1851.

Enoch T. Cobb's Statement.

The quarter acre of land, on which I raised white beans, has been planted with corn, twelve years in succession, previous to the past summer, and has been covered over each year with a good coat of barn-yard manure, (compost,) turned under deep, with the plough, and has produced a good crop of corn each year during that period.

Last spring early, I manured it as I did the years before,—ploughed it early and deep. May 25th, ploughed it the second time, and planted it with small white beans, about two feet apart. September 20th. I harvested the beans, threshed them

out and spread them thin on the floor to dry. After being spread in the open air for fifteen days, and being fully dry, I measured up from what grew on the land described 9⅞ bushels of beans, a sample of which is presented for inspection.

Barnstable, *Oct.* 7, 1851.

Root Crops.

A gratuity of $3 was awarded to Joshua Crowell, of Dennis, for a crop of 230⅜ bushels of carrots, raised on one quarter acre of land, no premium for this crop having been offered by the society.

Joshua Crowell's Statement.

The land on which my quarter acre of carrots was raised this season, is a yellow loam, and is part of a tract of land, measuring four and a half acres, that I bought in October, 1845, at $23 per acre. I manured it for the first time in 1849, by ploughing under sea-weed, at the rate of 100 horse cart-loads to the acre, and planted it with potatoes, which came in very light. In the winter and spring of 1850, it was heavily manured with a compost of sea-weed and barn-yard manure and the carcass of a hump-back whale, say a hundred horse cart-loads to the acre, and again planted with potatoes, nearly all of which rotted.

Last April, I measured off one quarter of an acre, and carted on twelve horse cart-loads of compost manure, and May 1st, sowed carrots in drills, east and west, at the average width of twenty-six inches.

Expenses of Crop.

April 20th.—To 12 horse-cart loads of manure, -	$8 00
" Carting and spreading same, - -	1 50
May 1.—Ploughing and harrowing, - - -	1 00
" Seed and sowing, - - - -	60

June 15.—Hoeing between rows, - - -	$1 50
" 25, and July 5.—Weeding, four days, - -	4 00
Harvesting, - - - - - -	4 50
Interest on land, - - - - -	2 25
	$23 35
By 13,840 pounds carrots, or 230⅔ bushels, at 60 pounds per bushel, estimated at $10 per ton, -	69 20
Profit, - -	$45 85

East Dennis, *Oct.* 7, 1851.

Cranberries.

To Alvan Cahoon, of Harwich, for the best experiment in cultivating the cranberry on one quarter acre of land, was awarded the first premium, $5.

Alvan Cahoon's Statement.

Twelve years since, I purchased, for one hundred dollars, twenty acres of land, including a bush swamp of about two acres. The swamp I did not value more than five dollars at the time when purchased, the mud being from six inches to three feet deep, beneath which was white sand.

In the spring of 1846, I cleared off the bushes from about seven rods, and finished by covering with sand four inches thick, and set it with cranberry vines in hills eighteen inches apart each way. The first and second year the vines grew well and bore a little; the year past the average crop was one and a quarter bushels per acre.

The quarter acre examined by the committee, and which is offered more particularly for premium, I set with vines in 1847; the meadow prepared in the same manner as the above described piece. The vines grew very fast, without any care, after setting them. The quarter acre yielded, in 1849, six bushels; in 1850, thirty-five bushels; and in 1851, fifty-four bushels. The expense for preparing meadow, setting the vines, &c., I estimate at one dollar per rod.

Since 1847, I have set with vines about fifty rods each year; they are all now in a flourishing condition.

Produce of one quarter of an acre for three years, 95 bushels, at $2 75 per bushel, - -		$261 00
EXPENSES.		
First cost of meadow, setting vines, &c.,	$40 00	
Picking, freight, and all other expenses,	25 00	
		65 00
Net profit of the quarter acre for three years, -		$196 00
Do. of the seven rods do., - - -		60 00
Total, - - - - - -		$256 00

HARWICH, *Nov.* 3, 1851.

COMPOST MANURES.

To Joseph C. Mayo, of Orleans, for the most satisfactory experiment in preparing compost manures, was awarded the first premium of $8.

Joseph C. Mayo's Statement.

Heap No. 1 was composed of sea drift, muck and some clay. These were put, in layers of each, into a yard built on a low spot of ground. The first of March, 1850, I purchased three shoats for $13 50; I kept these in the yard till the middle of October. One of them had four pigs, which I sold when four weeks old

For - - - - - -	$8 00
The shoats weighed, when killed, 600 pounds, and sold at 7 cents per pound, - - -	42 00
	$50 00
Deduct first cost, - - - - -	13 50
	$36 50
Whole cost of keeping, - - - -	20 75
Net profit, - - - - -	$15 75

In March, 1851, I carted out from the yard twenty-five cords of good compost manure, all worked over by the shoats, the worth of which I shall not pretend to decide, but which I have no doubt is valuable. Cost, at $1 per load, is $25.

Heap No. 2 was composed of the scrapings of my barn yard through the summer and fall, together with sea-drift, muck, and anything else I could get. I put on two casks of lime and two bushels of salt, and a lot of sizing made of all the slop matter I could obtain. In February last, I carted the whole to land I intended for corn, into heaps of sixteen loads each, where it remained till I wanted to plough in April, when I carted it out and ploughed it in. The heaps contained 192 horse loads or 38⅖ cords, the cost of which was $1 25 per cord, making $48.

Heap No. 3 consisted of the manure of one horse, one colt, (two years old,) one cow and one yearling heifer. I saved the urine of all these animals, by means of a vat in my barn cellar. I commenced this heap March 1st with a layer of sea-drift, a layer of barn yard manure and a layer of muck, and so on till it was raised five or six feet high. I then turned on my sizing, and in a few days there was heat sufficient to rot the whole mass. I then carted it to my corn land and ploughed it in. This heap contained 11⅗ cords, at $1 per cord, $11 60.

Orleans, *Oct.* 8, 1851.

WORCESTER COUNTY WEST AGRICULTURAL SOCIETY.

It was intended this Report should follow that of the Worcester County Society, but it was accidentally omitted.

This society held its first meeting, January 22d, 1851, when the following resolution was adopted:

Resolved, that this society proceed in all necessary measures to procure an act of incorporation from the Legislature of the Commonwealth.

The act was obtained the 17th of March following, and was accepted by the society. The officers and trustees were chosen. Dr. William Parkhurst, of Petersham, being elected president, and Dr. Joseph N. Bates, of Barre, secretary. The society numbers at this time about five hundred members, with fair prospects of a generous increase of funds from the friends of agriculture.

The first annual fair and cattle show of the society, were held at Barre, the 1st of October, 1851. Its recent formation preventing the receipt of the liberal bounty from the State, the citizens of Barre contributed the funds awarded as premiums on the occasion. The order of exercises commenced with a fine display of horses and colts, mostly of the stock extensively known as the Morgan horse. More than one hundred choice animals, of different ages, were presented for inspection, comprising many superior specimens of excellent selection, and careful and attentive breeding. In the opinion of many competent judges, the display of colts and horses has no where been equalled at any show in this Commonwealth. This portion of our State, must ere long bear the palm in the breeding and rearing of that noble and useful animal, the horse.

The exhibition of working oxen was very superior in point of numbers and quality. The number of yokes of cattle exceeded one hundred, and elicited high encomiums from all observers, for their condition and apparent capacity. The show

of fat cattle was a feature of the day, well adapted to excite the emulation of all breeders and producers for the shambles. H. Bacon, of Barre, exhibited thirteen fat oxen of different breeds, weighing thirteen tons. N. Turner, of Phillipston, presented several fine specimens of fat oxen. One pair of oxen, offered by Timothy Nurse, weighed 4650 pounds. There were also several fat cows and steers on the ground, of a superior quality.

Justly celebrated as is this section of our county for superior milch cows, and for the great attention bestowed by our breeders to this portion of farm stock, much was anticipated by those interested in this department of the exhibition, and the high-raised expectations of all concerned, were more than realized.

The show of young cattle, of sheep, swine and poultry, was large and good, and well calculated to excite a growing interest in the future exertions of the friends of the society to compete with other similar institutions, older and more eligibly situated than our own.

The ploughing match and trial of working oxen were looked upon with great interest, and perhaps have nowhere been excelled for precision and care in the execution of the ploughing, or for the kindness and docility displayed in the management of cattle at the load.

The fruits exhibited by the friends of the society from the adjoining towns, was of superior varieties and quality. Apples, especially, were in profusion, and attested the nice distinctions of our cultivators of this most excellent fruit. This part of the county may safely challenge competition in the production of apples of superior size, flavor and firmness, with any other section of the Commonwealth.

The other departments of the exhibition were well represented—vegetables, flowers, and the varied and skilful productions of the fairer and most interesting portion of all societies; all tending in a remarkable degree to establish a precedent for Worcester County West Society, which she will ever strive to emulate.

The address before the society was delivered by William S. King, Esq., of Manton, R. I.

ABSTRACT,

Showing for what objects Premiums were OFFERED *by the several Agricultural Societies in* 1851, *and the amounts of the same.*

SOCIETIES.	Bulls.	Milch Cows.	Heifers.	Working Oxen.	Greatest number of pairs of Working Oxen from any town	Steers.	Fat Cattle.	Horses and Colts.	Sheep.	Swine.	Poultry.	Ploughing—double teams.	Ploughing—single ox teams.	Ploughing—horse teams.	Ploughing with horses or oxen.	Ploughs, and their trial without a holder.	Effects of subsoil ploughing	Management of farms.	Gardens.	Reclaiming wet meadows.	Reclaiming waste or barren land	Subduing bushes in pastures.	Improving pasture lands.	Irrigation	Experiments on manures.	Turning in crops as a manure.	Preparation of compost manure	Application of sea weeds.	Milk.	Bread.	Maple Sugar.
Essex,	$18	$34	$39	$28	-	$30	$23	$48	-	$31	$20	$33	$20	-	-	-	$15	$100	-	$30	-	-	$25	-	$25	$15	-	-	-	-	-
Middlesex,	45	44	30	20	-	17	18	-	-	16	15	28	28	$28	-	-	-	57	-	20	-	-	-	-	-	-	-	-	-	$14	-
Worcester,	43	97	55	43	-	68	55	-	$14	38	29	-	55	-	-	-	-	70	-	30	$30	-	-	-	25	-	-	-	-	-	-
Worcester West,	9	5	5	15	-	6	9	13	2	6	2	-	-	-	$15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hampshire, Franklin and Hampden,	20	26	13	35	$45	30	20	91	9	16	33	-	20	36	-	$36	10	90	-	10	-	-	-	-	25	-	-	-	10	-	-
Hampden,	24	35	9	57	42	31	60	53	24	46	8	-	-	-	28	-	-	45	-	10	$10	-	-	-	14	9	-	-	5	-	-
Franklin,	12	18	5	18	23	12	26	48	9	15	-	-	-	-	20	11	10	-	-	13	-	-	-	-	-	-	-	-	4	-	-
Hampshire,	9	15	5	14	30	25	10	35	5	9	4	-	-	-	10	-	8	20	-	16	-	-	-	-	10	-	-	-	5	$2	-
Berkshire,	25	54	21	54	-	41	12	57	66	26	-	-	28	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Housatonic,	22	36	21	54	-	40	13	54	54	23	7	-	28	28	-	-	-	-	$6	30	-	-	-	-	-	-	-	-	-	-	2
Norfolk,	23	28	36	19	-	28	16	50	8	40	25	28	33	20	-	-	17	160	-	25	25	-	-	-	30	14	-	-	$32	20	-
Plymouth,	13	16	19	16	-	18	33	25	-	-	-	-	49	-	-	-	15	60	-	-	-	$16	-	-	-	-	$24	$16	-	-	-
Bristol,	36	28	13	36	-	27	25	8	10	20	-	9	20	12	-	-	-	20	-	30	-	-	-	-	-	13	-	-	-	-	-
Barnstable,	12	15	8	-	-	17	22	32	10	29	-	-	20	20	-	-	-	20	-	10	-	-	-	10	-	-	-	-	-	-	-

PREMIUMS OFFERED—Continued.

SOCIETIES.	Butter.	Cheese.	Bees and honey.	Grain crops.	Root and vegetable crops.	Bean crop.	Broom corn.	Flax.	Hay crop.	Hay seed.	Fruits and vegetables.	Flowers.	Cranberries.	Forest trees.	Trees set on the road side.	Fruit trees.	Hedges.	Mulberry trees and silk.	Introduction of new and valuable grasses.	New and valuable varieties of native fruits and seedling potatoes.	Comparative value of crops as food for cattle.	Experiments to determine advantages of cutting hay as food for cattle	Fattening cattle and swine.	Soiling of cattle.	Implements and inventions.	Agricultural essays.	Domestic manufactures.	Discretionary premiums.	Whole amount.
Essex,	$48	$24	$5	$36	$48	$8	-	-	-	-	$40	$10	$30	$180	-	$62	-	-	-	$105	$25	-	$15	-	$20	$10	$98	-	$1188
Middlesex,	10	-	-	30	23	-	-	-	-	-	-	-	50	93	-	37	-	$60	-	-	-	-	-	-	-	-	-	$50	753
Worcester,	22	33	-	-	53	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	$50	-	-	-	-	-	50	890
Worcester West,	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93
Hampshire, Franklin and Hampden,	10	9	30	24	-	5	-	-	-	-	21	-	10	-	-	32	-	-	-	-	-	-	-	-	-	-	57	100	873
Hampden,	17	17	4	37	23	6	$6	-	-	$7	47	-	-	-	-	32	-	-	-	-	-	-	-	5	-	-	70	-	781
Franklin,	6	3	-	16	10	-	5	-	-	-	18	-	3	10	-	24	-	-	-	-	-	-	-	-	-	-	25	18	382
Hampshire,	5	5	-	-	-	-	-	-	-	-	26	-	-	-	-	16	-	-	-	-	-	-	-	-	20	-	37	-	341
Berkshire,	14	14	-	142	19	-	-	-	-	5	18	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	80	-	744
Housatonic,	21	21	-	121	31	5	-	$5	-	9	53	6	-	-	-	24	-	-	-	-	-	-	-	-	33	-	122	-	869
Norfolk,	58	-	12	44	46	6	-	-	$6	-	55	15	25	30	-	78	$15	-	-	65	25	-	28	$25	10	120	95	-	1435
Plymouth,	25	25	-	101	38	10	-	-	-	-	40	-	16	205	-	38	-	12	-	-	-	-	-	-	12	30	125	-	997
Bristol,	21	12	11	45	33	10	-	-	9	-	14	-	15	120	$27	29	-	-	$8	-	-	-	-	-	-	-	100	-	761
Barnstable,	10	5	-	35	19	6	-	-	-	-	15	-	9	10	-	24	-	-	-	-	-	-	-	-	5	-	30	25	418
																													$10525

ABSTRACT,

Showing for what objects Premiums and Gratuities were AWARDED *by the several Agricultural Societies in* 1851, *and the amounts of the same.*

SOCIETIES.	Bulls.	Milch Cows.	Heifers.	Working Oxen.	Greatest number of Working Oxen from any town.	Steers	Fat Cattle.	Horses and Colts.	Sheep.	Swine.	Poultry.	Ploughing—double teams.	Ploughing—single ox teams.	Ploughing—horse teams.	Ploughing with horses or oxen.	Ploughs, and their trial without a holder.	Effects of subsoil ploughing.	Management of farms.	Gardens.	Reclaiming wet meadows.	Reclaiming waste or barren land.	Subduing bushes in pastures.	Improving pasture lands.	Irrigation.	Experiments on manures.	Turning in crops as a manure.	Preparation of compost manure.	Application of sea weeds.	Milk.	Bread.	Maple sugar.
Essex, - -	$20	$34	$34	$28	-	$6	$13	$38	-	$28	$20	$33	$20	-	-	-	-	$25	-	$25	-	-	-	-	-	-	-	-	-	-
Middlesex, - -	36	26	26	24	-	15	8	-	-	17	13	28	28	$28	-	-	-	57	-	20	-	-	-	-	-	-	-	-	$15	-
Worcester, - -	43	59	57	43	-	68	55	-	$14	36	21	-	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Worcester West, -	9	5	5	15	-	6	9	14	2	6	2	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hampshire, Franklin and Hampden,	23	26	24	43	$55	44	22	92	10	20	39	5	19	36	-	-	-	-	-	10	-	-	-	-	-	-	-	-	10	-
Hampden, - -	24	40	15	72	39	17	54	66	19	43	8	-	-	-	$28	-	-	-	-	4	-	-	-	-	-	-	-	-	4	-
Franklin, - -	12	18	5	18	18	21	26	-	9	13	6	6	-	-	20	$3	-	-	-	-	-	-	-	-	-	-	-	-	5	-
Hampshire, - -	7	14	6	14	30	24	10	35	4	9	4	-	-	-	13	-	-	20	-	16	-	-	-	-	-	-	$16	-	6	$1
Berkshire, - -	23	44	23	54	-	41	-	57	66	26	6	-	25	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Housatonic, - -	22	36	16	54	-	40	13	57	54	23	5	-	22	32	-	-	-	-	$3	-	-	-	-	-	-	-	-	-	-	-
Norfolk, - -	43	18	47	11	-	17	16	32	-	41	27	38	33	20	-	-	-	25	-	37	-	-	-	-	-	-	-	-	10	-
Plymouth, - -	13	19	11	16	-	16	35	25	-	-	12	-	54	-	-	-	$10	20	-	-	-	-	-	-	-	-	24	$16	-	$1
Bristol, - -	37	26	23	37	-	29	30	21	11	16	2	14	24	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Barnstable, - -	12	4	8	-	-	10	10	19	-	3	4	-	11	18	-	-	-	12	-	-	-	-	-	-	-	-	8	-	-	-

Premiums Awarded—Continued.

SOCIETIES.	Butter.	Cheese.	Bees and honey.	Grain crops.	Root and vegetable crops.	Bean crop.	Broom corn.	Flax.	Hay crop.	Hay seed.	Fruits and vegetables.	Flowers.	Cranberries.	Forest trees.	Trees set on the road side.	Fruit trees.	Hedges.	Mulberry trees and silk.	Introduction of new and valuable grasses.	New and valuable varieties of native fruits and seedling potatoes.	Comparative value of crops as food for cattle.	Experiments to determine advantages of cutting hay as food for cattle.	Fattening cattle and swine.	Soiling of cattle.	Implements and inventions.	Agricultural essays.	Domestic manufactures.	Whole amount.
Essex, - -	$48	$8	$6	$24	$18	-	-	-	-	-	$39	$5	-	-	-	$22	-	-	-	-	-	-	-	-	-	-	$82	$556
Middlesex, - -	10	-	-	20	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	$5	-	-	404
Worcester, - -	22	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	506
Worcester West, -	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94
Hampshire, Franklin and Hampden,	10	6	-	28	6	-	-	-	-	-	25	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	124	690
Hampden, - -	17	17	4	28	8	-	-	-	-	$2	53	-	-	-	-	28	-	-	-	-	-	-	-	-	54	-	51	695
Franklin, - -	6	3	-	11	4	-	-	-	-	-	11	-	-	-	-	6	-	-	-	-	-	-	-	-	9	-	22	252
Hampshire, - -	4	3	2	-	-	-	-	-	-	-	22	-	-	-	-	25	-	-	-	-	-	-	-	-	15	-	30	330
Berkshire, - -	30	-	-	167	19	-	-	-	-	6	16	-	-	-	-	30	-	-	-	-	-	-	-	-	30	-	100	793
Housatonic, - -	21	21	-	134	36	-	-	-	-	-	64	9	-	-	-	-	-	-	-	-	-	-	-	-	14	-	87	763
Norfolk, - -	18	-	4	38	6	-	-	-	-	-	61	6	-	-	-	15	-	-	-	-	-	-	$5	-	-	-	54	632
Plymouth, - -	25	25	-	96	36	$6	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	21	-	102	623
Bristol, - -	21	14	4	15	-	-	-	-	-	-	63	-	-	$80	-	-	-	-	-	-	-	-	-	-	15	-	87	588
Barnstable, - -	7	2	-	14	3	6	-	-	-	-	29	-	$5	-	-	-	-	-	-	-	-	-	-	-	-	-	35	220
Agricultural Publications were also offered and awarded, as premiums, by most of the Societies.																												$7146

MASSACHUSETTS BOARD OF AGRICULTURE.

In publishing the Transactions of the Massachusetts Board of Agriculture, it may not be uninteresting to give a sketch of the origin of the Board, with some account of the doings of the Convention, which immediately preceded it.

At a meeting of the Trustees of the Norfolk Agricultural Society, January 28, 1851, it was *voted*, "that the president and secretaries be a committee to mature and adopt a plan for a convention of delegates from the various agricultural societies of the Commonwealth, to be holden at some convenient time and place, the object of which shall be to concert measures for their mutual advantage, and for the promotion of the cause of agricultural education."

In the discharge of their duty, the president, Marshall P. Wilder, and the secretaries, Edgar K. Whitaker and Edward L. Keyes, as this committee, addressed communications to the presidents of the several agricultural societies in the State, who cordially approved of the plan of the convention and united in calling it. The convention was accordingly announced to be holden at the State House, in Boston, on Thursday, March 20th, 1851, and in order to increase the interest and usefulness of the occasion, the officers and trustees of the abovenamed societies, and such delegations as might represent them, were invited to attend.

Associated Agricultural Convention.

On the day named, the convention assembled, at 10 o'clock, in the Green Room, and was organized by the choice of the following officers, the vice presidents being the presidents of the several societies represented by them:

PRESIDENT.

MARSHALL P. WILDER, OF THE NORFOLK SOCIETY.

VICE PRESIDENTS.

JOHN C. GRAY, . . .	OF THE	STATE SOCIETY.
LEVI LINCOLN, . . .	"	WORCESTER SOCIETY.
JOHN W. PROCTOR, .	"	ESSEX SOCIETY.
E. R. HOAR, ...	"	MIDDLESEX SOCIETY.
MORGAN LEWIS, . . .	"	BERKSHIRE SOCIETY.
SETH SPRAGUE, . . .	"	PLYMOUTH SOCIETY.
J. H. W. PAGE, ...	"	BRISTOL SOCIETY.
WILLIAM CLARK, . .	"	HAMPSHIRE, HAMPDEN AND FRANKLIN SOCIETY.
JEREMIAH MAYO, . .	"	BARNSTABLE SOCIETY.
JOSIAH HOOKER, . .	"	HAMPDEN SOCIETY.
GILBERT MONSON, . .	"	HOUSATONIC SOCIETY.
ALFRED BAKER, . . .	"	EAST HAMPSHIRE SOCIETY.
HENRY W. CUSHMAN,	"	FRANKLIN SOCIETY.
GEORGE DENNY, . . .	"	WESTBOROUGH SOCIETY.

SECRETARIES.

E. K. WHITAKER, OF NEEDHAM,
E. L. KEYES, OF DEDHAM,
WILLIAM S. LINCOLN, OF WORCESTER,
SAMUEL A. DEAN, OF TAUNTON.

The blessing of Heaven was invoked upon the convention by Rev. Mr. Huntington, of Boston.

The President, in his opening remarks, said:

It may, perhaps, be expected that your presiding officer should propose business for the convention. There are many subjects which may be introduced, and which, in the opinion of the chair, require attention; but the suggestion of them will more properly emanate from a business committee, who may be charged with the duty of presenting such topics as are deemed most important.

It may not, however, be improper, in this stage of proceeding, to allude briefly to a few points which may be deemed worthy of consideration.

Among these may be named,

1. The expediency of so arranging the annual exhibitions

of the various local societies, as to permit of more frequent intercourse and interchange of civilities, for the promotion of the great object of their organization.

2. The propriety of adopting a more uniform system as relates to premiums, and the principles upon which they are awarded.

3. It may be important for the convention to inquire into the expediency of constituting a central committee, consisting of representatives from the various county and district societies, who may meet semiannually for consultation in regard to their general interests. Individual societies can accomplish much, but associated effort, more.

4. It is also to be hoped that the cause of agricultural education, now about to receive the consideration of the Legislature, will not be overlooked in the deliberations of this body, and if it be the opinion of this convention that agriculture may be promoted by the application of science, that such a sentiment may be expressed in terms so explicit as not to be misunderstood, and that the aid of government may be solicited for this purpose.

And, gentlemen, I submit, in view of the present condition of agriculture in our Commonwealth, whether there is not occasion for the assembling of this convention; whether there is not a necessity for improvement in this most important branch of human industry, and for the patronage of government to place it on a par, at least, with other arts in point of wealth, honor and influence. For if agriculture is the parent of all arts; if it is the basis upon which rests individual and national wealth and prosperity; if it is intimately connected with the virtue and happiness of the community, then it is the duty not only of philanthropists to foster it, but also of government to make it one of the first objects of her guardian care and protection.

Agriculture should especially receive the encouragement of government, because it embraces more than three fourths of our population, because from it is derived a very large proportion of her revenue, and because that large class, who are engaged in it, are, to a great extent, the conservators of the

public good in times of danger and peril. Agriculture is the prominent pursuit. It employs more capital and labor than all other trades and professions, and in proportion as it prospers, will the welfare of the community advance. But how has agriculture progressed with other callings in Massachusetts?

Facts warrant the assertion that there is occasion for great improvement. This is apparent from the rapid increase of population and the comparative decrease of agricultural products in this State. By the report of the valuation committee, it appears that although since 1840 there have been added to the area under improvement in Massachusetts, 342,000 acres of land, which at that time were classed as "*unimproved*," or "*unimprovable*,"—and although the tillage lands have been increased more than *forty thousand acres* in the same time, yet the grain crops have largely decreased; and although, during the same period, the upland and other mowing lands have increased nearly fifteen per cent., yet the hay crops have been increased only about three per cent.

In 1840, the population of Massachusetts was 737,700, requiring, at six bushels per head, 4,426,200 bushels of bread stuffs for their subsistence. Of this, the soil produced 3,705,261 bushels, leaving 700,000 bushels to be supplied by foreign production. But in 1850, the population of the Commonwealth is *one million*, an increase of thirty-three and two thirds per cent., requiring *six millions of bushels of bread stuffs* for consumption, and of which she raises but about *three millions*, leaving *three millions* of bushels to be supplied by foreign production, showing a depreciation in her cereal grains of more than 600,000 bushels; and should the inhabitants of this Commonwealth increase in the same ratio for the next, as for the last ten years, and without a corresponding increase of the grain crops, we shall, at the close of that term, be dependent on foreign sources for nearly *five millions* of bushels of bread stuffs annually.

These facts show that however productive other labor may have been, agriculture has not progressed proportionably with the other arts. It should, therefore, receive the special attention of Massachusetts in SELF DEFENCE; for unless our farms

can be made more productive and profitable, we shall continue to be dependent on other portions of our country for a large share of the necessaries of life, and her sons will look to other and more fertile lands for a residence.

Agriculture should receive our SPECIAL ATTENTION, for although we may, for the present, purchase with our manufactures the grain and beef and other products we consume, yet the time will come when the manufacturer and mechanic will place himself down by the side of the producer, thus saving the expense of transportation to both, and when Massachusetts will be obliged to rely, more than she now does, on the products of her soil for the support of her population.

Shall we learn wisdom by this experience? Or shall we continue the exhausting process of perpetual cropping, without the application of science to restore the productive energies of the soil? So devastating has been this practice, that *one thousand millions of dollars*, it is estimated, would not more than restore to their primitive richness and strength, the arable lands of the United States, which already have been partially exhausted of their fertility; and that, should this prodigal system continue to the close of the present century, the natural fertility of all the remaining American territory, will, long before that period, have been abstracted.

Is it not, then, a question of vital importance to the Commonwealth whether the great interest of agriculture shall remain stationary, or whether it shall move on in the line of improvement with the other departments of human industry? It is undoubtedly wise policy to encourage and foster any species of industry which is adapted to the wants and conditions of a community; but just in proportion to the prosperity of the agricultural interest, will ultimately be the ratio of success in all the other great industrial pursuits.

Who doubts that our lands are capable of yielding more than double their present productions, with little or no increase of expense? How many thousands of acres there are in the Commonwealth, also, which produce no income whatever, and which, in reality, are the richest portions of our soil, and by the application of science may be made to produce abundantly?

If, therefore, we desire to retain the young farmers of our Commonwealth,—the future pride and support of the State,—we must place within their reach the means of producing a result so desirable.

Similar advances may be realized by the application of science in the improvement of our cattle, horses, swine, &c., and in the saving and scientific application of manures.

Take an example :—

We have 150,000 cows in this Commonwealth. Suppose science enable these, or improved breeds, to yield *one* additional quart of milk per day; this, at three cents per quart, would increase the productive capital of the State, $4,500 per day, or $1,642,500 per year; or, if *two* quarts per day, a gain of more than *three million dollars* annually.

We have 70,000 horses in the State, and which might, by a better knowledge of the principles of breeding, be improved so as to command at least *fifty dollars* each, more than they are worth at present; this would increase their value *three millions and five hundred thousand dollars.* Who doubts that with a better understanding of the laws of agricultural chemistry, and the proper adaptation of crops and manures to the soil, that our cereal grains might be increased *ten bushels* to the acre, without additional expense? This would add *several millions* of dollars to the present amount of products.

Doubtless these results can be attained, or science is a chimera, and all the laws of animal and vegetable physiology a delusion.

It is susceptible of proof that the loss of manure in the Commonwealth, by misapplication and waste, is more than two millions of dollars per year. Now suppose this enormous loss were appropriated scientifically, who can estimate the additions which it would make to the products of the soil?

We need information in all these branches of husbandry. We have materials, but they need system; they need the encouragement and patronage of government. We make no objections to what the Commonwealth has done for educational and charitable purposes. Our Common School Fund now amounts to nearly a million of dollars; but great as are the

blessings which have flowed from this, why should not a portion of the State income, from the same resource, be appropriated for agricultural education?

With the view we have taken of the present condition of agriculture in this Commonwealth, is it not the imperative duty of all associations like those we represent, to enlarge their fields of usefulness, and to awaken, if possible, a more earnest interest not only in the minds of our State and National legislators, but throughout all classes of the community on this most important subject.

In conclusion, if agriculture can be promoted by the application of science, then it is the manifest duty of government to extend to it the hand of protection. Massachusetts is world-wide renowned for her system of education. Let her perfect it by extending it to all her sons,—to the farmer as well as to the professional man. Let her legislators take up the subject in earnest. Let them look at the matter with no narrow or grudging policy, but with generous and enlightened liberality. An appropriation now of a *few thousand dollars* for this cause, will add, ultimately, *millions* to the productive capital of the State, and will be of more substantial benefit to her citizens, than any similar appropriation ever made.

Massachusetts has always taken a leading part in most of the great enterprises which mark the progress of society, and we trust that she will not now hesitate to promote by her legislation an interest, which, more than any other, will redound to her future glory and permanent prosperity.

Gentlemen of the Convention: I congratulate you on the large attendance of delegates, all of whom I am most happy to meet on this occasion, and I doubt not that the results of this meeting will not only be productive of good to ourselves, but it is hoped will be of some advantage to those who may come after us.

Upon motion, it was voted, that an invitation be extended to the Governor, Lieutenant Governor, members of the Council, and both branches of the Legislature, to attend the afternoon and evening sessions of the convention.

Afternoon Session.

The convention assembled in the Representatives' Hall, at 3 o'clock. The attendance was quite large, and among those present were many of the leading agriculturists of the Commonwealth.

Mr. Sewall, of Medfield, from the Business Committee, reported for the deliberation of the convention the following preamble and resolutions:—

Whereas, Agriculture, the parent of the arts, is essential to the subsistence and preservation of the human race, and embraces in itself the elements of national wealth and power,—therefore, be it

Resolved, 1. That the encouragement and advancement of agriculture, should be with us, as it has been with other civilized nations, a leading object of public regard, to be cherished by a generous public sentiment, and liberally sustained by the resources of the Commonwealth.

Resolved, 2. That it is expedient to establish a Central Board of Agriculture, to be composed of delegates from the various incorporated agricultural societies of the Commonwealth, whose duty it shall be to meet semiannually, or oftener, if it shall be deemed expedient, and to recommend to the several societies uniform rules of action, and to take into consideration all subjects pertaining to the interests of agriculture.

Resolved, 3. That, whether acting as individuals, or as representatives, the citizens of the Commonwealth are bound to encourage the application of science to all those branches of industry which minister to human comfort and happiness, and thereby to the wealth and prosperity of the State.

Resolved, 4. That agricultural schools having been found, by the experience of other nations, efficient means in promoting the cause of agricultural education, which is so essential to the prosperity of farmers and to the welfare of communities, it becomes at once the duty and policy of the Commonwealth to establish and maintain such institutions for the benefit of all its inhabitants.

Resolved, 5. That the several plans for an agricultural school, recently reported by the board of commissioners appointed for that purpose, are worthy the profound consideration of the people of Massachusetts, and their representatives in the General Court, as indicating the feasibility and practicability of an establishment worthy that exalted character which the State has secured by the endowment of kindred institutions, designed, like these, for the diffusion of useful knowledge among the people.

Resolved, 6. That inasmuch as agriculture is the chief occupation of her citizens, the Commonwealth, in the organization of its government, should be provided with a department of agriculture, with offices and honors commensurate with the importance of the duties to be discharged, of the abilities to be required, and of the labors to be performed.

Resolved, 7. That the several county and local agricultural societies, (already the adopted children of the Commonwealth,) by their pioneer efforts in diffusing useful knowledge among the people; by their agency in arousing and directing the energies of the farmer in the course of modern improvement, and by the encouragement they offer to every worthy effort of agricultural skill and industry, recommend themselves still more powerfully to the protection and patronage of the Legislature.

Resolved, 8. That the convention respectfully suggests to the Legislature the propriety and expediency of reserving the entire proceeds of the sales of the public lands of the Commonwealth,—from and after the period when the Common School Fund shall have reached the maximum fixed by the act of 1834,—for purposes of education and charity, with a view to extending that aid and encouragement to a system of agricultural education, which the importance of the subject so imperiously demands.

Upon motion of Mr. Sewall, the resolutions were taken up in order, with the exception of those relating to agricultural schools, which were deferred until the last.

The first resolve was read and adopted on motion of Mr. Keyes, of the Norfolk Society.

The second resolution was next read, whereupon Mr. Page, president of the Bristol Society, addressed the convention as follows:—

I do not like to have this resolve pass in silence. I think there is matter there which will commend itself to the judgment of every gentleman who has given the subject of agriculture and agricultural societies in Massachusetts any consideration. We have had agricultural societies for years, in various parts of this Commonwealth. Each has gone on, in its own way, to accomplish the good objects which are proposed by all. But, sir, the action of each of these societies has been isolated, confined to itself, communicated, with very few exceptions, to nobody, except those who happened to be present at the annual exhibitions; and even, sir, where a report is annually prepared, as it has been in the two years of the existence of your society, and in Essex and one or two others, it is a local matter after all, and finds its way into the hands of but very few of the practical farmers of the Commonwealth. The result of this state of things,—this want of coöperation,—has limited the benefit that agricultural societies are capable of accomplishing. The objects for which premiums are awarded

are substantially the same, so far as my observation of the bills of fare has gone, throughout the Commonwealth; differing somewhat according to the peculiar features of the industry in the different parts of the Commonwealth; but, on the whole, they are about the same. The amount of premium offered, differs very essentially. The amount of encouragement which it is thought necessary to bestow upon different branches, differs very materially in different places, though the subject is of equal importance in different parts of the Commonwealth. The mode of operation, the mode of putting on paper that which is thought worth recording, and the extent to which that is done, differs materially in one county from another. There is no concentration. There is no permanent recording. There is no distribution of information. So that these societies, though they have accomplished vast good, have failed, in my judgment, to accomplish the greater amount of good that they might have done.

The proposition before you is for the organization of a Central Committee. The details of the constitution of that body are not carried out in the resolve. But the idea has been suggested that it should be composed of some of the officers of the different societies of the Commonwealth; that they should periodically meet, as suggested in the resolve itself, to devise and recommend to the other societies some uniform mode of action; and that they, beyond that, should take into consideration all those subjects which are useful in agricultural societies.

Now it seems to me, that this proposition needs only to be stated, in order to commend itself to the approbation of every gentleman. It is a very innocent matter, at any rate. Whether the Commonwealth of Massachusetts shall or shall not extend that aid to agriculture, which it has given already to almost everything else,—whether the action of this day shall result in any important good or not to the farmer of Massachusetts,—whether any dollar shall now or hereafter be appropriated to the promotion of agriculture or not, this matter is required equally to be done under the existing state of things, and under any possible future state of things,—whether you have schools or not. They are necessary in order that little county

collections may be made, and that the farmers may there interchange views and may get ideas which they will reduce to practice. They will be necessary in order that men may encourage each other by acting together, to talk over these subjects of common interest. If you have your agricultural schools or not, carried on under any plan, still I think you need these same agricultural societies, as their business is distinct entirely from that of your agricultural schools, each working in its own department in the same great cause. And, in any event, while you have these agricultural societies you will need this central association in order that they may all stand on the same platform, that they may have the same object in view, and the same general mode of carrying out and attempting to accomplish that object.

It is supposed that this association, formed of delegates from each of the societies, would come together at stated periods, and have meetings other than stated ones, whenever occasion may require; that facts of interest may be laid before them; that the light of minds from all parts of the Commonwealth may be brought to bear; that they may devise rules which may be presented to the several societies throughout the Commonwealth; and that we might, by concerted action, accomplish that, which, by acting separately, it has been heretofore impossible to produce, and probably to all time, in the past desultory mode of action, would be impossible to produce.

Mr. Proctor, president of the Essex Society, remarked:— I fully accord with most of the views that have been suggested, and believe that there is room, by delegates coming together from the different societies, of very much improving their mode of administering their affairs. I think, sir, these societies owe to the Commonwealth something of this kind. They have now been established, many of them, about thirty years. The Commonwealth has appropriated $5,000 to $7,000 annually, for their support. Generally, if I understand it, they are in a good degree of favor throughout the Commonwealth. I believe they are thought, in their different spheres, to have done much useful service.

Now the remark has been made, that their meetings con-

flict with each other. Several of these meetings come on the same day. It would be well that there should be an undertanding that they should come one after the other, so that individuals could go into other counties and see what was done there; that they could, by their practical observations, carry home that which they might find valuable. In this way the objects of the premiums would be suggested to them, and the manner of offering them. In this way there might be very great improvement in the discharge of the duties of committees in reporting on the subject.

I believe, it has been found by the gentleman who has prepared the annual abstract which has been published by the Legislature, that in different counties there is a very great variety of the degree of attention paid in preparing those reports. In some counties it has been an object to make those reports worthy of notice; to make them the means of disseminating useful knowledge. And when they are embodied together, a useful book is furnished. If the State is to be at the expense of publishing annually the reports of the several counties, it is very desirable that the digest should be drawn up in such a form as to be creditable to the State. Any gentleman who has examined the reports of the state agricultural society in New York, will find that it gives a fund of original information,—a treasury of valuable knowledge every year. Constitute this board, and Massachusetts, though far inferior to New York in size and means, would still come into respectable comparison with her as affording useful information on this subject. Until the Legislature shall carry out the more general recommendation of the establishment of a board of agriculture, as one of the departments of the State, it seems to me proper that the agricultural societies, who are now the foster children of the State, should be so far organized as to do this as well as they can.

E. K. Whittaker, of Needham, remarked:—The gentlemen who have addressed the convention upon the resolution which is now before it, have very properly explained what is the object of this resolution. But they have not said what I think

may very well be said, and with saying that, I shall take my seat. It seems to me that what is proposed to be carried out in this resolution, is very fully exemplified in what we see here to-day; and that is, the gratifying circumstance, that on a call issued, gentlemen without hesitation have come up here for the purpose of seeing whether we cannot do something for agriculture. And, in accordance with that desire, it is proposed to bring the active minds of the State, who want to see improvement, into a committee who shall examine in detail the matters on which the different societies are interested, and see if something cannot be done to waken the people to more interest in this department of industry, which seems almost to have been forgotten, though it was once the main interest of the State. We may accomplish what we want to see carried out by the movement, without difficulty. We may feel satisfied, from what we see here to-day, that with a committee organized as is proposed, something will be obtained which will create the new interest we wish to secure. I think that the faces we see here to-day are the best proof of this; and I hope that not only will the resolution be passed, but that gentlemen will feel that that is not the last of it; that if they are to carry anything into effect in their county organizations, they should meet at once for the purpose of selecting out the most active minds they have, for the purpose of doing something in the different departments of agriculture.

Remarks of Mr. Sprague, president of the Plymouth Society:—It was not designed by the committee, that the resolution should at all reflect upon or interfere with the character or operation of the State Agricultural Society.

The State society have done much for agriculture in importing different breeds of cattle, and distributing them gratuitously through different parts of the Commonwealth. They have done a great deal for agriculture; and gentlemen who have been eminent in public life, who have now gone to their graves, and who were devoted to agriculture in the arduous labors they performed in connection with that society, deserve our highest acknowledgments. But the State society cannot make arrange-

ments for the time of the agricultural societies to hold their meetings. The State society cannot well arrange the premiums and the details of the operations of the several county agricultural societies. They have no means of doing it. It is utterly out of their power to do it.

Now this Board will be composed of gentlemen knowing the wants of the several agricultural societies and their manner of doing business. They can there consolidate their views and information, and carry out the details as regards the premiums, the reports, the publications, and the various operations of the different societies. Many of our premiums, as given by our agricultural societies, do very little good. They are a mere name. We give, in the Plymouth society, a premium for the best milch cow. Now we have no report of the sizes or dams of those cows. We have no report of their blood; whether they are of one breed or another,—of their shape or their size; but we have merely the quantity of milk and the feed which they have had. This affords us very little opportunity for improvement. It is so with our working oxen. We want the information that some gentlemen in the Commonwealth have acquired. We want, as the gentlemen have said before, to know something of what they have learned. And if we have anything to communicate, we will communicate with them. This is the grand object; and it seems to me that it might be carried on without interfering with the State society. It is not intended to interfere, and if it should be thought that it does reflect on that society, I hope that it will be so managed as that it will not do so.

Remarks of Mr. Gray, president of the State Society:—I see nothing in this resolution which reflects upon the State society. While I say that the State society, or the gentlemen who have had the administration of it, have done all in their power to promote the interests of agriculture, and would have been happy if their power had been greater, I think I may say for them that they will feel no objection to this resolution. The State society, if they had done anything for agriculture, are bound to say that their labors have been fully appreciated. They were the earliest society in existence, and I believe that

from the beginning they have been treated with the utmost liberality as well from the government of the Commonwealth, as from the county societies.

But I have said more than once, that if the State society has conferred any benefit upon the Commonwealth, one of the greatest has been this,—that by the impulse which they gave to the study and practice of agriculture, whatever it may be deemed to have been, they led to the formation of the county societies. They were, if they may be allowed to call themselves, as teachers, in the situation of many other teachers, who very soon taught their scholars to go beyond themselves. The local societies have advantages which no board of a State society, or of any one society can well have, because the officers who compose any one board, though having the interest of the State in view, cannot well be collected from all parts of the State, because they cannot well meet without inconvenience. I understand that this resolution contemplates that the State society shall be represented as well as the local societies in this board which it is now proposed to establish. I have only to say that any measure calculated to bring together the knowledge which exists in the agricultural districts of the Commonwealth in this way, or in any other way, in my opinion ought to meet and would meet the full concurrence of any member of the State society, or of any other agricultural society in the Commonwealth. I am entirely satisfied that we have one object, and I cannot see, for my own part, anything in this resolution to which the society to which I have the honor to belong would find any cause to object.

The question was then taken and the resolution adopted.

Mr. Page then offered the following resolution, which was adopted :—

Resolved, That the President and Secretaries of this Convention be a committee with power to take measures for the organization of the Central Board of Agriculture, as recommended by the first resolve, and that such Board be authorized to petition the Legislature for an act of incorporation, if they shall think it expedient.

The question was taken on the third resolution, and it was adopted.

The sixth resolution was taken up, on which B. V. French, of Braintree, spoke as follows:—

This proposition is so expedient, and commends itself to the approbation of so many, that perhaps it should pass without remark. But I can see much in it to interest every mind. We should have an organization which can combine and unite the interests of the several societies, by means of which communications can be kept up between them. In New York this is left with the secretary, who corresponds with the other organizations, and looks after the interests of the various societies. A few evenings since, this proposition was suggested to me, and it struck me that we did want a place which would answer for a kind of head-quarters, where we could exhibit agricultural implements, models of everything that could interest the farmer, such as a committee could approve of, and where a person could go and see the instrument which is most valued by the committee. I think this is a resolve that is calculated to do an immense amount of good to the cause.

George Denny, president of the Westborough Society:—The resolve was considered a very innocent one,—that agriculture was of so much importance that it demanded the same stand among the people that the other branches of education had. The machinery which should be connected with it was not determined upon, but was left to the future.

Edward L. Keyes:—These resolutions, it may have occurred to the gentlemen who have seen the report of the late commission, are all based on that report. This resolution is but one of their recommendations. It is, simply, that a State department of agriculture should be established. Of course, the details are to be in accordance with the purposes and objects of the department. The department of the militia has its adjutant-general and its arsenal. The educational department has a board of education, and secretary, and agents. It is proposed that this department of agriculture shall have a board, and a secretary, who shall lecture, collect statistics in relation to agriculture, make digests of the reports, and publish such facts and statistics as will be necessary to promote the welfare of agriculture. This resolution simply acknowledges the principle.

The details are to be arranged, provided the principle is adopted, by persons having charge of that matter.

Mr. Page:—The report of the agricultural commission has not fallen into the hands of many gentlemen in the remote part of the State. How fully it has been understood in this part of the Commonwealth, I am unable to say. But I beg leave to read a section to which this resolution has reference. The section refers to a plan for the promotion of agricultural education, that goes before it, but will be sufficiently intelligible by itself:—

Section third is as follows:—"The undersigned recommend the establishment of a State department of agriculture, to consist of a board of commissioners and a secretary, whom they shall annually appoint, which board shall sustain a similar relation to agriculture and the schools connected with it, as the board and secretary of education do to primary schools."

This recommendation of the commissioners, has reference to a previous recommedation of theirs for the establishment of an agricultural school or a system of agricultural schools. And a part of the recommendations in this section would presuppose the existence of such institutions, and a part of the duties would be dependent on such existence. But if none of the institutions are ever established, there are duties there which would be profitable, if faithfully performed, in my part of the State, and I apprehend elsewhere also.

"The duty of the secretary shall be, under the direction of the board, to give lectures in various parts of the Commonwealth, whenever it may be deemed expedient, on the science and practice of agriculture." That subject has been hinted at again and again, at agricultural meetings for years. The hint is thrown out in the enthusiasm of the moment, when the people are thought to be more agriculturally inclined than at any other time, and then is forgotten.

A wise man going among the people would do undoubtedly a vast deal of good to the farmers and to their sons. I am of the opinion, that the establishment of such a secretaryship, in efficient hands, would be as effective an instrument as could be established for the improvement of agriculture.

Sir, our young men want something more than their fathers know how to teach. What is known now by the farmer about farming? Precisely what was known about it fifty years ago, with very little variation! I heard an anecdote from one of the committee to-day which illustrates the position of our young men. A wealthy farmer, with a large farm, died recently in this vicinity. He left five sons, ranging from ten years, upward. He is hardly cold in his grave before they determine to give the farm up. When remonstrated with, they say, "We want to know something. We shall know just as much as our fathers did, and we wish to know more." Now it is a fact that our young men want to know more than their fathers. It is desirable that this knowledge shall not be like the Indians' knowledge, traditionary, handed down from generation to generation. But we want the printed page, that the farmer can take in his hands as he sits by his fireside, and that his sons can take in their hands in their leisure hours,—the printed page, upon which are the results of the practical knowledge of wise men, brought to bear distinctly upon this subject. Now I pray to ask, if you do nothing else here for this vastly neglected branch of industry, how you can do a better thing than to say that you will send out in into the community just such a man as is spoken of here. He will not only carry knowledge to the young men, but he will create a thirst for knowledge. I think that the time is ripe for the Commonwealth to take this step, at least, and that the people will say amen to their action, however liberal, in sending them such knowledge as that.

Well, sir, that is one thing that the secretary will do. He will go forth as a scientific and practical farmer, to enlighten the people throughout the Commonwealth. He will carry information and he will gain information. But, then, it is proposed that he shall "receive the returns of the incorporated agricultural societies, and make a digest of the same in the form of an annual report to the Legislature," instead of having it the duty of the Secretary of the Commonwealth, who has, I believe, always delegated it to other hands, who have annually formed an abstract and thrown it through the press. The

Secretary of the Commonwealth has enough to do. He never has done this duty personally, and I think he never will do it except through other agencies. It is proposed to place it in the hands of a man whose life is agricultural, the breath of whose nostrils is agriculture, who eats it and drinks it, and who is given up to agriculture, accomplished in it throughout. Make it his duty to do it, and I will venture to say that it will be not only as good a book as is now produced, but one which will be read throughout the Commonwealth. He will contribute to make it better in this way. He will suggest to the local societies what are the subjects to which their minds should be directed. He will have the elements in a far better condition than the Secretary of the Commonwealth has ever received them from the secretaries of the agricultural societies.

The secretary is required "to collect agricultural statistics and information in the various departments of this science; to correspond with local societies in this and other lands." Here is an instrument by means of which the secretary can get information from all over the world, and this little report will tell him where he can get his information. He will produce a volume which will be valuable to the practical farmers, and not to the book-farmers alone, (though I speak that word with a great deal of respect, and not with the sneers which some have used,) applicable to all farmers all over Massachusetts.

The secretary shall have it a part of his duty to devise the means of improving agriculture in general throughout the Commonwealth. Well, sir, if the government of the Commonwealth should, in their wisdom, see fit to establish an agricultural school, it seems to me that this thing would be necessary. This kind of organization, this bureau of the government, would be necessary in order to carry that plan into effective operation, and to bring it to a point so that it can act in connection with the local societies that now exist. If those schools are not established, then this precise thing, so far as it can be applicable, is needed by the people of this Commonwealth in order to bring to a focus the information that is had now and is to be had all through the State, and to put life into our societies and make them more active in promoting the cause of agriculture.

John Brooks, of Princeton :—This resolution seems to squint towards a college. If it has that tendency, I shall be opposed to it; for I do not believe that the farmers are prepared to spend money in instituting a college. I think it would do them no good whatever. This resolution seems to interfere with one which has just passed. We have passed a resolution for a central board, making it their duty to collect this very information and compile it into a book. It seems to be the same duty here. If that is the case, two such resolutions are not necessary. As for lecturing to the people, I doubt whether that is advantageous for the very best reason to my mind in the world,—that the lecturer will not know what to say; that he has no data on which to make out any speech, because science, as I understand it, is based upon facts. What facts has this commissioner that are applicable to agriculture in this State? I say, sir, generally speaking, no fact. And why? Because the science of agriculture has not yet grown up in this country. We are dependent entirely upon Europe, as I understand it, for our agricultural science. You may pile this room full of European agricultural books, and you may condense all the knowledge which they contain applicable to this country into a primer. Therefore, if this gentleman goes out to lecture, he has nothing to found his lecture upon. And to be dependent upon Europe, is of little or no use to us, inasmuch as our circumstances, our facts, our influences are entirely different in connection with agriculture here, from what they are in Great Britain or in Europe.

I have not had the pleasure of reading the report of the commissioners. But I understand it gives an account of a vast number of agricultural schools in Europe. Suppose we take the Prussian system; do you believe it can be carried out here? I believe that the farmers will not agree that it can do good. For that reason, and for the reason that I have said that we have no science yet formed, it seems to me that an agricultural school cannot be a benefit.

There is another reason. We must begin at the end; that is, we must begin at the bottom. We must create ourselves. This board, so far as it might be made useful, is a very good

thing; and if it does not squint towards a college, I might be in favor of it. It might be useful in collecting information all over the State. The gentleman says that young men abandon their farms because they cannot improve. Perhaps that may be the case. If so, it is for the reason that I have said, that we have no science. We have no data to go upon. We have only our own experience.

Remarks of Professor Wm. C Fowler, of Amherst:—Science is, in itself, the same the world over. In its applications it may be varied according to circumstances. The application of science to agriculture in this country may vary from its application in England, in consequence of the peculiar circumstances connected with our climate or soil. We must, therefore, first determine what these peculiar circumstances are, and then we shall know how to employ science in aid of agriculture in our own country. If it be true, as the gentleman says, that we have no American science and no Massachusetts science, then upon this assumption of his, the very first thing which we ought to do is to have an American science, and a Massachusetts science.

But leaving the ground assumed by the gentleman, I come back to the true ground, namely, that science is the same all over the world. It is our business to see that its applications to the art of agriculture in Massachusetts are such as they ought to be. In the first stages of civilization, art precedes, science follows. In the advanced stages of civilization, science precedes, art follows. All the higher processes of the useful arts are dependent on science.

There have been immense additions made during the last fifty years to science in general, and to those particular sciences which relate to agriculture. This is true of chemistry, of geology, of mineralogy, of botany, and vegetable physiology, of zoölogy, and animal physiology. Accordingly, the governments of Europe, as we learn by the excellent report of the agricultural commission, lately published, are extensively taking measures, by means of agricultural colleges and schools, first to apply these sciences to the art of agriculture, and next, to communicate extensively a knowledge of the applications

thus made, for the general benefit of the profession of agriculture. I would take the liberty to recommend to the worthy gentleman who last spoke, to read this report before he makes objections to a plan for the improvement of agriculture in Massachusetts, based on that report. You need only to read this work, or one of the reports of the patent office, or the better class of agricultural newspapers, in order to know that there have been immense additions to agricultural science, strictly so called, and to those sciences in general which may be applied to the art of agriculture.

The fact, indeed, seems to be generally admitted that there has, in one quarter and another, among men of science and the cultivators of the soil, been a great increase of knowledge, both theoretical and practical, on this subject. But the light is scattered, not concentrated, and, therefore, not effectual. It is light such as has, by some, been supposed to exist after God said, "Let there be light, and there was light," and before the sun was created. According to this theory, they suppose that the light thus diffused through space, thus ineffectual, thus incapable of being applied to any useful purpose, was collected by the Creator and concentrated in the sun, which he "set in the firmament of the heaven, to give light upon the earth," so that "the greater light should rule the day, and the lesser light the night," and order thus be brought out of chaos.

Something like this may be true of the science and of the practical skill which is scattered over the land and the world. What we need is an organization, under the authority of the State, which shall collect this scattered light, whether in this or in another hemisphere, so that it shall become effectual, and not any longer be "light shining in darkness, and the darkness comprehending it not." What we need, is an organization which shall collect the light of science and of practical experience into an agricultural institution, as into a focus, from which it can go forth, as from a radiant point, over the Commonwealth and the country, and, if you please, the world.

Remarks of Judge Mack, of Salem:—It has been said, sir, that we have no science. It is too true that we have not much science on the subject of agriculture in Massachusetts. And this

fact makes it imperative that we take some means by which we can collect facts. All science has been built up upon facts. And unless we take measures to collect them upon the subject of agriculture, we never shall have any science here. There is science enough upon the subject of agriculture to apply these sciences to the art of agriculture, and next, to communicate extensively a knowledge of the applications thus made, for the general benefit of the profession of agriculture. I would take the liberty to recommend to the worthy gentleman who last spoke, to read this report before he makes objections to a plan for the improvement of agriculture in Massachusetts.

Remarks of Hon. Amasa Walker, Secretary of the Commonwealth :—

Before we admit that confusion exists in relation to agriculture, and all this chaos which the learned gentleman from Amherst supposes, the question naturally arises, how happens it that, at this late period, there should be so much chaos and confusion with reference to agriculture? For I believe that they do exist ; that there is all this chaos, confusion, uncertainty and the want of application of true science to agriculture. And why, sir? I have had occasion to notice recently some very good reasons why all this should be true ; and the general reason is this.

We have a great number of agricultural societies in different parts of the Commonwealth. Those societies carry on their operations through the year. They have their exhibitions. They offer their premiums. They have their reports. And what does it all amount to? It amounts to this,—that all these different societies, as a general remark, have been operating upon different principles, that is, without any well established and uniform principle, and hence they do not arrive at any well established and uniform results.

For instance, in the article of Indian corn, what do we ascertain from the reports of all the agricultural societies in this State? We ascertain nothing that is true in relation to any one point in regard to the raising of Indian corn in this Commonwealth, because we have no uniform system on which statistics are made. For instance, in one society they have it

weighed and in others measured; and in three societies that I know of, they include the cob, allowing seventy-five pounds to the bushel. Statistics which must be based on such various methods of ascertaining the quantity of an article raised, do not establish anything.

Just so in relation to the product of milch cows! We have no statistics which can be brought together, by which an average can be made of the product in different parts of the Commonwealth. My learned friend, from Amherst, used the right figure, "perfect chaos." It proves nothing.

This is the fact in relation to agriculture so far as I understand the matter. What then must be done? What is contemplated in that resolution? A central board! A board of agricultural education! A board of agricultural statistics! A board which shall establish a uniformity of action among all the societies, so that their statistics will be valuable! We all feel the vast importance that has been given to the cause of education by the establishment of the Massachusetts Board of Education, and the great improvement that has been produced in our common schools in consequence of the action of that board. I suppose we have there a board similar to what is wanted in agriculture, if we wish to accomplish what our friend from Worcester County desires,—a board which shall establish uniform returns from all the counties.

We do establish such regulations with regard to education. Every district school in this Commonwealth has to make its returns precisely on the same data and the same principle. Then we can make out our aggregates, we can make our deductions, and we can learn lessons of wisdom in relation to our schools. Now I suppose that precisely this is wanting with regard to agriculture. And since this State makes liberal grants every year for agricultural societies, would it not be right, would it not be expedient, that the State should require systematic and regular returns, the same as are made from the common schools; and unless those returns are accurately made, according to the prescribed form, that the society should not receive the bounty of the State. Without that, I have no hope of anything being done.

From the position in which I stand, I have had this subject brought home to me. The returns have been sent to me. They are all chaos. But by the assistance of a very able gentleman, a sort of abstract has been made from the returns of all the societies. They are somewhat interesting at least, but they do not prove anything. And my mind has come to the conclusion, very recently, that if we hope for any progress in agriculture, we must have a central board; we must have everything arranged as it is in the common school board; and we must have one mind devoted altogether to agriculture. Out of the million we can easily spare a single mind. What person in the Commonwealth is devoted entirely to agriculture, I mean to the broad field of agriculture, to the theory and practice of agriculture? I do not know any such one. Is the president of any of our agricultural societies, or the secretary, or the treasurer, thus devoted? No! they do what they can, and we are much obliged to them for it. But we want one mind devoted to the subject.

You have seen what the Secretary of the Board of Education accomplished. It surprised us all. Yet I think far greater results would be accomplished if we had a Secretary of the Board of Agriculture, who should lecture, who should try to ascertain facts, and to awaken a general interest in the subject of agriculture. If this were the case, if such a board and secretaryship were established and sustained, nothing could be more gratifying to the farmers of the State.

Remarks of Johnson Gardner, of Seekonk:—

I have supposed that science was science all over the world; that so far as regards chemistry, geology, and all other sciences pertaining to agriculture, what they had learned in Europe we might learn; that a chemist there, analyzing air and finding it contained oxygen, hydrogen, &c., would merely find the same article essentially which a chemist analyzing air here would ascertain. I suppose the same with regard to agriculture. I would establish this board. I think it would be one of the best things we could do. I do not precisely agree as to the effect of the local societies. I believe they are doing a vast good. I believe every town in the county of Bristol has felt

the effects of the Bristol Agricultural Society. I believe if you make the additional appropriation of one hundred dollars to every society, raising a thousand dollars, that these societies will do much more than at present.

Simon Brown, of Concord, made a short and practical speech, suggesting that if the secretary should only present a single new idea to his auditors in each of his lectures, it would prove very valuable to the farmers; illustrating his position by stating that if he should only teach them how to analyze the soil in such a way as to be able to determine what are the constituents of a given amount of earth, and what parts are wanting in order to make it yield the largest crop of a certain article, an incalculable amount of good would be derived by the community.

Evening Session.

The Convention was called to order at 7 o'clock. The seventh resolution having been taken up for consideration, the chair called upon his excellency, Governor Boutwell, who addressed the convention as follows:—

This resolution has reference to what has been accomplished already by the societies which exist in our State. They constitute a part of the imperfect system of agricultural education. There are various town societies,—few in number at present, but efficient in their operation,—which constitute another part of this system. And it would seem expedient, if efforts are to be made to extend and elevate agricultural education, that those means which exist ought to be employed.

The first question which a convention of this character would naturally consider, is, whether there is a necessity for improvement in agricultural education? And, upon this point, I suppose there would not be much difference of opinion; for it cannot but be as true of agriculture, as of any department of industry, that it is to be advanced and perfected by the operations and labors of intelligent and scientific men.

It cannot be denied, that while other departments of indus-

try in this Commonwealth, and in this section of the country to a considerable extent, have had the benefit of scientific education and scientific improvement, agriculture, in this respect, has been almost entirely neglected. If, then, it is conceded that there is a necessity for agricultural education, and for improvement in it, we are to inquire, who are to be the teachers? What are the means to be employed? and, who are the men or individuals in the community to be taught?

It would seem proper that we should avail ourselves, so far as possible, of the means which exist. We should use what we possess, if it be efficient, rather than attempt to create more than is absolutely necessary. Now, if we have institutions that to any considerable extent can be made available for these purposes, for the present,—even though they should be inadequate for the future,—I apprehend it would be regarded proper, on all hands, that we should use those institutions and those means.

In some countries, science may be in the possession of a few individuals in the community, and may be used in such a way as to control and give direction to the manual labors of other men. But in this country, science is not in that way to be applied. We have no masters controlling large bodies of laboring men. But if we are to educate the farmers of this Commonwealth, it must be by educating the great mass of them. The majority must in some way be reached. It will not do to give to certain individuals the *science*, with the expectation that certain others are to apply that science without knowing something of the reasons which exist for its application.

We are, then, to carry the knowledge to the great mass of the people. And the question is, how is it to be done? If we educate a few men, it may happen, and very likely will happen, that from the nature of their pursuits, they will be unable to approach and communicate with the mass, so as to make their knowledge available in this department of industry.

It is not more than twenty years since, that we had two classes of teachers in our public schools. And it is not too much to say that they entirely failed. The one class was composed of young men sent out from our colleges into the interior

towns and small districts of the State; and, as a general thing, it may be said that they failed to produce the result which good teachers ought to produce.

We had another class which acted as teachers. They came from the mass of the people. They possessed some of the qualifications for teachers, but they were deficient in many particulars. Neither of these classes met the wants of the community. Now it may happen that we shall constitute a class of men who, in some respects, will resemble the young men who went out from the colleges to the district schools; and if we do, they will most certainly fail to accomplish the results which we expect.

We have instituted, with regard to our common schools,—and, I take it, we can reason somewhat from analogy,—we have instituted Normal Schools to furnish instruction to young men and women as teachers. They go there for the purpose of qualifying themselves as teachers. And, I take it, these institutions have accomplished most perfectly the object which the State and their patrons had in view at their establishment.

Now we are, in some way or another, to connect the science of the college and the laboratory with the labor of the farm. And the great question I apprehend is, how is this to be done? It was said here the other night, at the legislative agricultural meeting, that if you take young men and send them to college, for the purpose of instructing them in science, with the expectation that they would go out and instruct the farmers of the State, they would fail. I thought there was some force in the remark.

Now we want, in the agricultural system of education, a class of men who shall combine the science of the school with the labor of the farm. Now, to my mind, it is apparent that they must be drawn, in the main, from among the farmers themselves.

You must begin with the farmers, and work up,—infusing into the great mass of the people an increasing desire for scientific knowledge, which shall enable them to apply agricultural sciences to agriculture itself.

In what way, then, can you reach the great body of the

farmers of the State most effectively? I think we may do it by using, to some extent, the agricultural institutions which exist,—the town societies and the county societies. As in the common school system, the people have been led to maintain it voluntarily, so, I take it, the agricultural system of education is to be maintained voluntarily in the small communities of the State. You cannot establish any great system, which shall act upon the people directly and exclusively. You may encourage agriculture, but its support must come from them.

Hold out, then, the inducement to the people to educate themselves, and you will succeed. If you have an institution to educate men to go among the people, you will do something in that way. If you were to adopt the system of employing a certain number of scientific men, as we have employed common school lecturers, you might create an educational feeling which would be efficient. For example, if there are, at this moment, fifty town societies, and if you were to employ a certain number,—perhaps five scientific men,—whose duty it should be, in the summer season, to go where these institutions exist, (and nowhere else, that their establishment may be encouraged,) to receive and communicate information in relation to manures and crops; and if, in the winter, it were their duty to give lectures adapted to the wants of these localities, I take it you would do a great deal of good.

And if your munificence were confined to the towns where these associations exist, lecturers would increase as rapidly as the demand; and without extraordinary effort, you would introduce a system of agricultural education which should reach every young man, give him information, and cause inquiry among the great body of agriculturists. It would be the duty of those individuals to collect and distribute information, so that you would have a great system of lectures and experiments extending over the whole Commonwealth.

Remarks of William Buckminster, editor of the *Massachusetts Ploughman*:—I was surprised to hear the assertion, this afternoon, that we had made no improvement in agriculture for forty or fifty years past. If there is any useful agricultural knowledge in the country, I ask you where it is. It rests with

the practical farmers. They possess all the practical knowledge which is of any value. Chemists may talk as much as they please, with high flown language. The farmers have the practical knowledge.

The word science has been used. Science, we are glad to learn, is knowledge. Farmers understand that. There was one gentleman a little alarmed at science. He would not have it. Now, what is the use of telling us, farmers, that there has been no improvement for a dozen years past? I live in the vicinity of Worcester. Forty years ago, it was the practice there, among all farmers, to let their cattle run at large, saving none of the manure; and not one man in forty attempted to increase his manure by carting in substances to preserve the essences. Fifty years ago, the hogs ran in the road, and no manure was saved from them. Have not we made improvement? Your foreign chemists and your foreign professors will all tell you that manure is the very foundation of all production connected with agriculture; and yet gentlemen will tell you, and repeat that we have made no improvement with regard to farming, even when we produce four or five times as much on a given piece of land as we used to make, forty or fifty years ago. I want this thing well understood. We have been led astray ten times by chemists where we have got real information from them once.

But I would not undervalue chemistry. A farmer cannot do anything, unless he makes more from his farm than he spends. What we want, is to circulate the knowledge we possess. I know there are some farmers who never make any improvement. What we want is to wake these gentlemen up. And the way to do it is the very mode suggested this evening by his excellency, the governor.

The resolution was adopted.

The fourth and fifth resolutions, which were passed over in the afternoon, were now read by the chair.

The President.—There is a gentleman present who made the investigations in relation to these schools in Europe, President Hitchcock, of Amherst. I have no doubt the convention will be pleased to hear from him.

President Hitchcock.—I fully agree, sir, with the remarks which have been made by his excellency, and other gentlemen whom I have heard to-day, on the importance of using other means for promoting agriculture, besides establishing a school or schools. I hope no gentleman will imagine that the establishment of a school, however judicious a plan is adopted, is going at once to make any great change in our agriculture. It is only *one* of the means which are employed in Europe for that purpose. I am not going to compare the means. I do believe that agricultural societies are indispensable. It is one of the reasons why I could wish to see schools established, that they may form a channel by which we may communicate with the agricultural world, by which we can receive information of what is doing in other parts of the world, of what is doing in the cultivation of land, in the raising of stock, and in a multitude of subjects connected with agriculture. If you had a school, it would be a channel through which there would come this information; and it would be a sort of ordeal to pass through.

Now there comes floating somehow or other on the winds, an account of an improvement in agriculture. An individual farmer hears of it, and undertakes to make the experiment. He fails, perhaps. Then he is disgusted with everything of the kind. Now one grand object of a school of this kind, is to try experiments, to try suggestive experiments. For it is an indispensable adjunct of all the schools in Europe that I visited, with the exception of only one in Edinburgh, that they should have a farm connected with the school; that they should live upon the farm; that the professors and officers, at least a part of them,—those who have the management of the whole concern,—should engage in actual labor on that farm. Some of them do not do it for wages, and some do. But they all engage, more or less, in the duties of the farm, in the work on the farm, and in every kind of work, too. Even those who do not expect to labor in after-life, but who expect to have the superintendence of the labor of others, all go through the work.

I have mentioned in this report, the case of a school in France about twenty-five miles from Paris, where the director

of the school, a scientific man, conducted us out to the piggery; and there we met the young men connected with the school, evidently from wealthy families, all of them, including the director himself, with their frocks on. But I noticed that all the young men were engaged in some business about the farm. Each one had his duty to perform. One was to attend to such a thing, and another to such a thing. There was one young man who had a broom and a pail of water, and who was cleaning an ox's leg in a stable. The director whispered to us that that young man was the son of a wealthy banker.

The truth is, the farm is considered an indispensable adjunct to the school. Unless those who have the management of it, show better crops than others in the neighborhood, the government withdraws its patronage. And they do show better crops. I never saw better ones than those at Glasnevin, near Dublin. There, oats were raised eighty bushels to the acre; and other crops, wheat, flax, beans and potatoes in the same exuberance. This removes one of the great difficulties about these schools. I do not wonder that people shrink from making additional experiments, when they hear that this application of lime is going to work wonders, or guano, or something else, and when they have already made the experiment once and failed. A great many suggestions which are made by chemists are tried by the farmers with failure. I do not wonder that they fail. And, after all, they say, this science does not answer. We would better follow our fathers. That is to some extent true.

The first object of an agricultural school, as I understand it, is to collect together the experience of the best farmers in Europe or in the world, and to make that experience the basis of their operation. For, after all, the principles of science, although certain, if we understood them, yet are not well enough understood now, to be in all cases applied with certainty to the growth of plants. We acknowledge that. And, therefore, I would place first in the advantages of an agricultural school, the getting together all the experience, the important experience which farmers have had on the subject of farming, and testing it on the farm connected with the school, and then, if it proves good there, to recommend it to the public generally.

But as we are now situated, one farmer takes one method, and another, another; and it is difficult to ascertain what is best, what is correct. And that is one of the advantages of these societies; that they serve to collect these scattered rays, to bring them together to a focus, and to make out what is the best result of this experience. But, after all, we must have the sciences taught in such a school, and we may hope to get a great deal of advantage from it. For no man will deny that the plants which are raised upon a farm, grow according to the principles of botany and physiology, so far as those principles are understood.

Now botanists and physiologists have learned some things about how plants grow, what they require for food, what is the best mode for them to thrive. There is a great deal more to learn, and we want these schools to find it out. The chemist, too, can tell us something about the composition of the soil. He tells us that often a crop fails, because there is not a half per cent. of a certain ingredient. There are a great many other things which may be told in future. We may hope a great deal from the application of a great variety of the principles of science.

But, sir, I say that this business of raising plants, as men who conduct a farm do it, is a very complicated affair, and a very delicate one. I have been a lecturer on chemistry for twenty years. I do not now lecture on it. I have tried a great many experiments during that time. But I do not know of any experiments so delicate as the farmer is trying every week. I do not know any so difficult. The experiments of the laboratory are not to be compared with them. Will not a knowledge of the principles of chemistry help a man in his agricultural pursuit? Knowledge is not perfect yet. Will not such an acquaintance guide him somewhat? You have half a dozen sciences which are concerned in the operations of a farm. There is the science of meteorology, the condition of the atmosphere, the state of the weather, storms, sunshine, temperature; all these things have to be taken into the account. There is to be a delicate balancing of all these, as every farmer knows. A man who would understand the delicate operations

of farming, must know something about chemistry. The chemical operations are constantly going on in a plant.

That brings in another science,—physiology. He must know the laws of life, how this or that influence will affect the growth of plants; just as a physician has to learn physiology, in order to know how this thing or that thing will affect the life of individual men. You have then the science of physiology to be applied extensively. And so I might speak of botany and physiology, which are very much concerned in agriculture, the character of the soil, and a number of other sciences.

To suppose that a man is going to be able, at the present day, without any knowledge of these sciences, to make improvements in agriculture by haphazard experiments, is, it seems to me, absurd. Now, if we can gain, from the establishment of a school, a little advantage at first, we shall gain a great deal in time. We learn one thing after another, so as to make progress. That is what is doing in Europe. They have found there unless they have these schools, that scientific men, who are distinguished, will not attend to the matter of conducting these experiments, so that benefit will result. The French government have just established a school at Versailles, at the old kingly domain. And this is one of the reasons they have given for it,—we must have, they say, men who will devote their attention to this subject, who will push their discoveries to get some new thing, not expecting, at once, to obtain any great improvement.

Now these principles, the principles resulting from experience, the principles resulting from these sciences, can all be taught the young men who go to those schools. And it takes a great while to learn them. They are not applied extensively in our country, although we are making some progress. Only think, sir, this whole matter, the most difficult of all the arts, depending upon experiments the most delicate, and influences the most potent, for success or failure, whose dynamics, if I may so say, being such as to require the most acute mind, is all left for each individual man to find out. The wonder is, that the farmers of New England have done so much, not that they have not done more; because they have one of the most

difficult of all tasks to perform. And hence it does seem to me that a school is important, as one of the means for assisting in obtaining this information; not that it is going to work wonders. The people must come up to it.

It does appear to me that the question about the establishment of agricultural schools in Massachusetts, is merely a question of time after all.

The subject has made such rapid progress in Europe, within a few years, that I was perfectly amazed to find the facts develop themselves as they did, one after the other; to discover such a multiplicity of facts with regard to them. Gentlemen who have not seen this report will, perhaps, be surprised when I tell them that I give there an account of 350 schools, of three different grades. Though some of them have been in operation for fifty years, the most have been recently established. Gentlemen there did not seem to know how many schools there were.

I recollect getting acquainted with the Chevalier Bunsen. I thought I should know from him all about the number of schools in Prussia. He gave me a list of four schools in that country. When I went there, I found thirty. Probably he had not heard of them. Some of them were small. In France there are seventy-five. In Ireland they have fifty. And the Irish schools pleased me more than any others except the French. I had an opportunity, in Ireland, of hearing examinations of the young men. They were called in from the farm and asked questions on the subject of practical agriculture, as to draining, and how to adapt crops to different soils, and other matters of that sort. And then, as to agricultural chemistry, they were asked, What would you do in such and such circumstances? What does a soil with such and such properties need? and so on. I do not believe there is a class of students of any kind in our country, who would be able to answer one-tenth of the questions which those young men answered, very readily. And going out, as they do, to take charge of other schools, they will accomplish much for the benefit of unfortunate Ireland; and being concerned with their own hands in raising these crops, for other farms applying in the field those

principles which they learn in the school, I do not know how it strikes others, but it did strike me that it was a good way to promote agriculture. The societies are doing much, but it seems to me that these schools are to elevate the societies.

The remarks of his excellency are very proper. The people must do this thing. Such is the nature of our institutions, that if the people do not wish a school, the government cannot sustain one. If the people are not ready to force the government to help them, it will do no good. That was the case in Europe. Individuals there, even from the year 1774, struggled and sacrificed their property and their lives in this cause. They were repelled by the government again and again before they could get any assistance. Then they would start a private school, and would find it a heavy affair, as any such school must necessarily be. It must be a weighty concern, and individuals, one would suppose, would sink under it. But the thing has been done there, and the government has been, as it were, compelled to take hold of it. There is a feeling among the people which makes the government feel as if it must act. And availing themselves of the general peace in Europe, they have been trying to establish schools of agriculture.

Remarks of Richard Bagg, Jr., of Springfield:—Agricultural education is our great theme. It has become a very popular theme. The *phrase* is quite familiar, and yet we hardly know what is meant by it.

Our fathers are held in grateful remembrance, as philanthropists, because their first public acts were to lay broad and deep in the virgin soil of New England, *foundations* for those educational and religious institutions which have contributed, more than anything else, to give her importance and her sons influence.

Let it not be supposed, however, that intelligence is a natural production, indigenous to the soil of New England. It is the result of that *educational system*, whose genial influence permeates her every nook and corner; not only teaching "the young idea how to shoot," but teaching also the great lessons of *self-reliance* and *self-control; disciplining* New England mind to

conflict, to patient, persevering, arduous *effort*, and *accustoming* it, by these means, to *overcome* every obstacle.

Such mind has resources,—resources flowing at every step of its progress. Such *mind* can never be entirely baffled.; it is made *enthusiastic* by difficulties, and is never enervated by success. Such mind *must* accomplish its purpose, and *will*, even though the "iron be dull." Such mind, applied to the cultivation of the soil, will never assume the garb of the mendicant and "beg in harvest."

Let us remember that if the State provide the means and appliances for a scientific course of agricultural study, the young man must "wake up from his drowsy nap," and *qualify himself* "to go up higher."

Remarks of William S. King, of R. I. :—The two great evils agriculture has to contend against, are torpor and prejudice. That old torpor has been driven away by the persevering efforts of societies. They began their operation,—and I am not so young but what I remember their commencement,—and have continued their exertions faithfully to the present time. Men found that the secret in every combat was combination.

But there is a terrible power yet to encounter; and that is prejudice. How is this prejudice to be encountered? It is to be encountered by education. The man with maturity of years has grown up with all his prejudices. The old gnarled oak must stand as the winter of its youth has left it; but the young twig remains to be trained in the way it should grow.

Let the young farmer learn, at the start, that his occupation is the noblest of all. Let him remember that Washington called it "the most useful, the most healthy, and the most noble occupation of man." We want nothing stronger than that. Let him know that the farmer's path can be the path to greatness. There are men, I might say, perhaps, within the sound of my voice, who have passed directly from behind the plough almost to the pinnacle of political honors.

On motion of Mr. Denny,

Voted, That the Central Board, provided for in the second resolution, consist of three delegates from each incorporated

Agricultural Society, and that the president and secretaries be requested to inform the societies of this resolution.

First Meeting of the Massachusetts Board of Agriculture.

This association, composed of three delegates from each of the incorporated Agricultural Societies in the Commonwealth, was convened September 3d, 1851, at the State House in Boston. On motion, it was ascertained that delegates from all of the fourteen County Societies were present, and that the State Society was also represented.

The following list of officers, for a permanent organization of the board, was reported and accepted :—

Marshall P. Wilder, *President.*
Henry W. Cushman, } *Vice Presidents.*
John W. Lincoln, }
Allen W. Dodge, *Corresponding Secretary.*
Edgar K. Whitaker, *Recording Secretary.*

The President stated, briefly, the objects of the organization of the board, and especially directed attention to the great importance of concert of action on the part of the different societies.

John C. Gray, of the State Society, recommended that a committee be chosen, to report business to the board, and that said committee be constituted from the local societies. The State Society had set the example of instituting annual shows, and the County Societies had adopted the same course, and had even eclipsed the parent society. Mr. Gray gave a highly instructive statement in relation to the movements of the State Society, and the efforts it was now making to obtain from Europe the most valuable kinds of stock to improve our own.

On motion, voted, that Messrs. B. V. French, J. W. Proctor, and George Denny, be a committee to report business to the board.

On motion of Mr. Denny, it was voted that a committee, to consist of one from each society, be appointed to take into consideration the time of the several societies' exhibitions, so that they may not interfere with each other. While this motion was pending, a spirited discussion ensued upon the indispensable importance of systematizing the action of the various agricultural societies in the Commonwealth, so that the best interests of the farmer might be promoted. In this discussion, delegates from all parts of the State participated, and the committee was constituted agreeably to the motion.

At the AFTERNOON SESSION, the committee on recommending specific days for the annual exhibitions, submitted the following report :—

For Essex, . . .	last Wednesday but one in September.
" Worcester, . . .	last Thursday but one in September.
" Worcester (West,) . .	last Thursday in September.
" Norfolk, . . .	last Wednesday in September,
" Middlesex, . . .	first Wednesday in October.
" Plymouth, . . .	first Thursday in October.
" Barnstable, . . .	second Wednesday in October.
" Bristol, . . .	second Thursday in October.
" Hampden, . . .	last Thursday and Friday in September.
" Housatonic, . . .	last Wednesday and Thursday in Sept.
" Franklin, . . .	last Wednesday and Thursday in Sept.
" Berkshire, . . .	first Wednesday and Thursday in Oct.
" Hampshire, Franklin & Hampden,	second Wednesday and Thurs. in Oct.
" Hampshire, . . .	third Wednesday in October.

Voted, That the officers and delegates to the board, be requested to invite the coöperation of their different societies to carry into effect the above recommendation.

Mr. French, from the business committee, reported that committees of three be appointed on each of the following subjects, including the premiums to be offered, and the principles upon which they are to be awarded, viz. :—on Ploughing, Milch Cows and Dairy products, all other Live Stock, Farms and improvement of lands, Cultivation and Measurement of Crops, Agricultural Implements, Manufactures.

This report was accepted, and the President submitted the

following list of committees, who were requested to report upon the various subjects referred to them, at an adjourned meeting of the board.

Ploughing.—John W. Proctor, Seth Sprague, and Johnson Gardner.

Milch Cows and Dairy Products.—George Denny,* B. V. French, and Allen W. Dodge.

All other Live Stock.—Paoli Lathrop, Joseph Howe, and W. A. Gorham.

Farms and Improvement of Lands.—J. T. Buckingham, John Daggett and Horace Collamore.

Cultivation and Measurement of Crops.—J. W. Lincoln, Alfred Baker, Richard Bagg, Jr.

Agricultural Implements.—Simon Brown, S. Reed, and Charles S. Bursley.

Manufactures.—Charles C. Sewall, Samuel Chandler, and Samuel Powers.

On motion of Mr. French, a committee of five were chosen to report on the subject of agricultural education, and the best measures to be adopted for the encouragement of such education.

Upon this motion, a very able debate followed. The speakers did not differ as to the necessity and propriety of legislative action; but, several of them advocated the action of public-spirited individuals jointly with the Legislature, as in the foundation of the State Normal Schools, and Reform School, at Westborough. The discussion occupied most of the afternoon session.

The following gentlemen were then chosen this committee, viz.: the President, and Messrs. Proctor, Fowler, Page and Reed.

On motion, a committee of one was chosen to visit each of the agricultural exhibitions, the present year, and report at the adjourned meeting of the board. The names of the delegates to the several societies or those who were substituted in their place, will appear in connexion with the reports, which they respectively submitted.

* John W. Lincoln substituted, after the decease of Mr. Denny.

Voted, That a committee of three be chosen to report a constitution and by-laws, and what further measures are necessary to organize the board. Henry W. Cushman, W. C. Fowler, and James H. Knowles, were chosen said committee.

Second Meeting of the Massachusetts Board of Agriculture.

The board met, according to adjournment, at the State House, Boston, January 14th, 1852. The attendance was large, and nearly every county society in the State was represented.

Lieut. Gov. Cushman, from the committee appointed for that purpose, reported a constitution and a series of by-laws for the government of the board.

Constitution and By-Laws of the Massachusetts Board of Agriculture.

1. The objects of this association are the encouragement of agricultural education, and the improvement of agriculture in all its departments in this Commonwealth.

2. The members of the association shall consist of three delegates from each of the incorporated agricultural societies in the Commonwealth, that receive a bounty from the State. And the delegates now in office shall continue as such until the 2d Wednesday of January, 1853.

3. The officers of this association shall be a president, two vice presidents, a corresponding and a recording secretary, treasurer, and an executive committee of five, of which the foregoing officers shall be, *ex officio*, members; and said officers shall perform all such duties, as are usually incidental to their respective stations.

4. The officers elected on the 3d of September, 1851, shall hold their respective offices until the 2d Wednesday of January, 1853, and until others are chosen in their stead.

5. The annual meeting of the board of agriculture, shall be held at the State House in Boston, on the 2d Wednesday of January annually, at which time the officers shall be elected:—and meetings may be held at such other times as the executive committee shall determine.

6. Delegates shall be annually appointed by this board, to attend the cattle show and exhibitions of the several incorporated agricultural societies in the Commonwealth, and said delegates shall report at the annual meeting of this board.

7. These by-laws may be altered at any annual meeting of the Board, or at any special meeting called for that purpose.

The report was accepted, and the constitution adopted.

The President nominated the following gentlemen to constitute, with the officers of the board, the executive committee: Edward Everett, John W. Proctor, J. H. W. Page, B. V. French, W. C. Fowler, of Amherst; and they were unanimously elected.

The death of George Denny, of Westborough, having been announced by his colleagues from the Worcester Society, the following resolutions were submitted by Mr. Dodge, corresponding secretary, and adopted:—

The Massachusetts Board of Agriculture, having learned the death of Hon. George Denny, recently associated with them in the prosecution of the objects of the board: therefore,

Resolved, That this Board have learned with deep regret the decease of their late efficient and intelligent co-laborer, the Hon. George Denny, of Westborough.

Resolved, That whilst we bow with submission to the Divine will, that has removed from the scene of his earthly labors one whose life was so useful, we cherish with profound respect the memory of his valuable services in the cause of progressive agriculture.

Professor Fowler submitted the following resolution:

Resolved, That the President of the Massachusetts Board of Agriculture be requested to enter into a correspondence with the presidents of the several State societies and of other agricultural associations, on the subject of the expediency of calling a national convention for the purpose of taking into consideration the interests of agriculture in the United States.

It was discussed and unanimously adopted.

The President then presented the following report on

Agricultural Education.

The undersigned, in behalf of the committee to whom was referred the subject of agricultural education, submits the following preamble and resolves, as expressing the views of said committee:—

Whereas, Agriculture embraces within itself the elements of individual and national wealth and power; and *whereas*, this most important department of science has been in a great measure overlooked and neglected, while other branches have received the attention of the Legislature: therefore, be it

Resolved, That Agriculture is paramount to all other interests of society, and should be considered an object of special regard and patronage both by the government and by the people; and that whether acting as individuals or representatives, the citizens of this Commonwealth are bound to encourage and sustain every laudable effort for the advancement of this great department of human industry.

Resolved, That while this board gratefully acknowledge the pecuniary aid hitherto afforded by the Commonwealth to local agricultural societies, yet, in the judgment of the board, it is believed that neither these, or any other means now in operation, are sufficient for the full development of the agricultural resources of the State, or the continued and permanent improvement of this time-honored art.

Resolved, That the necessity for additional State patronage appears from the low condition and slow progress of agriculture, when compared with the thrift, industry and intelligence so conspicuous in almost all other departments of labor; especially does this necessity appear, from the rapid increase of population and the decrease of agricultural products in the State, and from the large quantities of produce brought annually into Massachusetts from the southern and western states, much of which, by a proper knowledge of the constituents of soils, crops, and manures, and their proper adaptation to each other, might be raised by our farmers in sufficient quantity for home consumption, and at a profit which would enable them to maintain a successful competition with cultivators in the more naturally fertile regions of the West.

Resolved, That the necessity for this improvement is apparent from the report of the valuation committee to the last Legislature, and by which it will be seen, that although there have been added to the lands, under improvement, since 1840, more than *three hundred thousand* acres, and although the upland and other mowing lands have been increased more than *ninety thousand* acres, or nearly *fifteen* per cent., yet the hay crops have increased only about *three* per cent., showing a relative depreciation of *twelve* per cent.; and although the tillage lands have been increased more than *forty thousand* acres in the same period, yet there has been no increase in the grain crops, but an absolute depreciation of more than *six hundred thousand* bushels; and although the pasturage lands have been increased more than *one hundred thousand* acres, yet there has been scarcely any augmentation of neat cattle, while, in sheep, there has been a reduction of more than *one hundred and sixty thousand*, and in swine, of more than *seventeen thousand*.

Resolved, That to prevent a further depreciation in the great interest of agriculture, and to raise this most important pursuit to that point of perfection which has been attained by most other arts, *a knowledge of the natural sciences is indispensable*; for if there are scientific principles on which successful cultivation depends, then no effort can be well directed unless it is founded on these principles.

Resolved, That Massachusetts, by an enlightened policy and wise legislation, has rendered her system of education worthy of her exalted reputation, and that this board most earnestly desire her to complete that system, by providing

kindred institutions for the scientific education of the farmer, upon whom is levied so large a share of the taxes for the support of governmental and philanthropic objects.

Resolved, That it is the duty, as well as the interest of the State, to aid in furnishing the means for such an education, and that for the want of this education, millions of dollars and a vast amount of time, energy and money, are annually lost to the Commonwealth, by the misapplication of labor and capital in husbandry; and *resolved, further*, that this loss is mainly to be attributed to the want of a proper system for the acquisition and diffusion of correct information, as to the most approved arts of cultivation, and the best means of perfecting this unfailing source of independence and happiness.

Resolved, That a thorough systematic course of education is as necessary to prepare the cultivator of the soil for preëminence in his calling, as to secure excellence in any of the schools of science or art;—that this necessity is universally acknowledged when applied to other pursuits, and that the yeomanry of Massachusetts have a right to claim from the government the same fostering aid which is extended to other great interests of the community.

Resolved, That inasmuch as agriculture is the chief occupation of her citizens, the Commonwealth, in the organization of its government, should be provided with a *Department of Agriculture*, with offices commensurate with the importance of the duties to be discharged, of the abilities to be required, and of the labors to be performed.

Resolved, That while this board would respectfully refer to the wisdom of the Legislature the maturing of a system by which the wants of agriculturists shall be supplied, and thereby the prosperity and wealth of the people of the State increased, they most earnestly invite the attention of legislators to the several plans and recommendations submitted by the commissioners concerning agricultural schools, to the last General Court, showing the advantages of such institutions in other lands, and indicating the feasibility and practicability of similar establishments in our own country.

Resolved, That this board respectfully suggests to the Legislature the propriety and expediency of reserving a portion of the proceeds of the sales of public lands of the Commonwealth, in accordance with the recommendation of said commissioners, and with a view to extend that aid to a system for the promotion of agricultural science, which the importance of the subject so imperatively demands.

Resolved, That Massachusetts has always taken a leading part in most of the great enterprises which mark the progress of society;—that she is worthy of the high character she has secured, by the endowment of institutions for the diffusion of useful knowledge among the people, and that by the adoption of efficient measures for the professional education of her farmers and the better development of her agricultural resources, she will add another wreath to her renown, for the elevation of her sons and the advancement of the best interests of society.

MARSHALL P. WILDER, *Chairman.*

An animated and interesting discussion took place upon these resolves, in which A. W. Dodge, Dr. Gardner, Mr. Tower, of the Berkshire Society, Mr. Lincoln, and Harvey Dodge, of the Worcester Society, Mr. Caldwell of the Worcester (West) Society, Mr. Daggett of the Bristol Society, and others, participated. Strong ground was taken in favor of a farm-school, where experiments in tillage, in breeding and feeding stock, tests of manures, &c., should be made by practical men, and reported for the general good; and where farmers' sons could learn the occupation of their life under the most competent farmers of the state; aided by a course of instruction that would enable them to analyze their soil, learn its deficiencies, and prescribe remedies. The further discussion of the resolves was postponed till the next meeting of the board.

Reports of Delegates.

The reports from the delegates appointed to attend the exhibitions of the different agricultural societies in the State, which took place during the past autumn, were read and accepted. From these reports, and those read at a subsequent meeting, the following extracts are made of such portions as are deemed to be of general interest, and as embody suggestions valuable to those who have the management of these exhibitions.

Exhibition of the Essex Society.

The Essex Society has, in many respects, been the model agricultural society of Massachusetts. It has, for a long series of years, not only *done*, but has had the wisdom to *record* its doings. Among its members have been numbered some of the most distinguished agriculturists and friends of agriculture in this country. It has not yet failed to have among its members those who worthily wear the mantle of its departed prophets.

In attending their exhibition, held at Salem, the 25th of September last, I expected to learn much and was not disap-

pointed. The change to this from the young, vigorous, and enthusiastic society of Norfolk, whose exhibition I had attended the day previously, at Dedham, was remarkable. Here as there, all was activity and life, but calm; and while the spectator admired, he was struck with the apparent unconsciousness of the actors that they were doing anything out of the ordinary course of business. You would think that they had been doing the same thing all their lives. Another striking difference was, that while, in Norfolk, many amateurs took part in the matter, here almost all were, or appeared to be, practical farmers. Salem, like Dedham, was full of people. Here as there, all were intent on one thing, the cattle show; all, good natured and obliging; and every one seemed disposed to do his share to make the day, which God had made so glorious, agreeable to his fellow-men.

The cattle pens were arranged in excellent order around the public square. The number of animals was not so great as I expected to see. Essex could do better, if she would, and she ought to do better. I saw none of those long strings of working oxen, such as the western counties are said to show. Essex could make a good exhibition in that way. I saw, however, in the pens, two pairs of working oxen, owned by Richard S. Rogers, of Salem, which, on that day, were "wisely (?) kept for show." They were noble looking animals—I think the handsomest I ever saw. They ought to have been in the field, and have tried their strength and skill with some dozen other pairs of fine animals, well trained, who may well "stand on tip-toe when that day is mentioned."

Of cows I cannot remember any that struck me as specially worthy to be handed down in history. The fat cattle were neither numerous nor remarkable. Of bulls, were the Devon, Ayrshire, Native, No-horns, and mixed breed, and some good animals of each class. There were some fine specimens of swine, and the show was, on the whole, very good.

Horses and colts, a great number and many noble animals. This was the best exhibition, in this department, that I have ever seen in Eastern Massachusetts. The breeding mares exhibited, do not promise well for the next generation.

The exhibition of poultry far surpassed any that I had ever seen. If any of the domestic feathered tribe was unrepresented, I know not what it was. There was a vast congregation of ducks, turkeys, geese, and hens in endless variety, and some that would put to shame old Grimes's hen, of classic memory, if their owners' reports were true.

At the hall the show was good. The Horticultural Society held its exhibition on the same day, at another place, and I was surprised to find an exhibition of fruits only second to that at Dedham. Articles of use and beauty, of domestic manufacture, seem to be abundant, but, alas! this crowd and this hurry prevent my looking at them as I would; and the fair matrons and maids who exhibit them, deserve that they should have more time bestowed upon them. Of manufactures not domestic, Essex could make a wonderful show, if she were disposed; but I see very few articles exhibited.

The ploughing match was well contested. The entries were not numerous,—not above ten or fifteen, I think,—too few surely for that county. How quiet the men are! how well disciplined their teams! How beautifully smooth the furrows are turned! But here is an exception—here is a strange looking furrow; how came such a bungler to enter the lists? Ah, ha! That is the Double Michigan Plough, is it? The president has got hold of it now. Let me watch it. By your leave, sir, I will step on here. How handsomely it turns over that sod and places it in the bottom of the furrow, and then the other share throws six inches of pulverized earth upon it. That must be a great implement. Bravo, Mr. President—the Emperor of China never did such as that.

A procession was formed and proceeded to the church, without music. On cattle show days, men, and women too, are in a state of exaltation. A little more "pomp and circumstance," would be better. A sound and interesting address was delivered, before a large audience, by Rev. Milton P. Braman, of Danvers. After the address, we proceeded to dinner. It was in a large and commodious hall. Some four or five hundred persons at table, and nearly all genuine Essex farmers, is a sight worthy to be seen and never to be forgotten. The occa-

sion passed off delightfully. His excellency the Governor was present, and made some remarks. Only one thing was wanting. No ladies were present. The Essex Society, which has taught others so many good things, may, in that particular, learn a good lesson of others. Here, as in Norfolk, two days are required to see what one would desire to see; to transact the business properly, and to do justice to the exhibitors.

J. H. W. PAGE.

Exhibition of the Middlesex Society.

This exhibition took place at Lowell, on the 24th day of September last, and the undersigned had the satisfaction of attending it, in company with Messrs. John C. Gray and Edward Everett, of the State Agricultural Society.

Being there, however, as an invited guest of the society, and not as a delegate from this board, and having no expectation of being called upon for an account of the exhibition, the undersigned did not pay that close attention to its details, which would enable him to describe them with anything of discriminating justice. He can only offer to the board, therefore, a general view of the occasion; and even in doing this at so late a day, he must be allowed to borrow from the accounts which were prepared by others at the time.

The festival was opened by a ploughing match, at which twenty-two teams were entered for the prizes. Of these, eight were double teams of four oxen each; ten single teams of a pair of oxen each; and four horse teams of two horses each. In the language of one well able to judge of such operations, "the ploughmen exhibited great skill in the use of their implements, in avoiding stones, and in the nice movements and changes of the plough in passing uneven places, in order to leave a smooth and workman-like furrow."

Next followed a drawing match, at which seven teams appeared on the ground. Some of the cattle engaged in this trial, were of great strength and beauty, and seemed under excellent discipline. They performed the work of drawing a load of

8,512 pounds, (wagon included,) for a distance of 40 rods, up hill, with remarkable steadiness.

The show of cattle in the pens, was large, and of a high order. Several native cows attracted attention as presenting the best points of the animal. Among them, was one belonging to Samuel Horn, of Lowell, which was said to have yielded twenty-six quarts of milk per day, during the months of June, July, and August; and another very fine cow, belonging to Alexander Wright, of Lowell, which was said to weigh 1,400 pounds. There were also a number of good specimens of the Durham, Devon, Alderney, or Jersey, and Ayrshire breeds. One yoke of fat cattle was on the ground, weighing 5,500 pounds.

There was no display of horses, or of sheep, the society not having been accustomed to offer premiums for those animals; and the show of swine, though presenting a few fine Suffolk boars and breeders, was small.

The exhibition of fowls was extensive and of the highest character. There were twenty-nine competitors in this branch of the show, and they offered for the prizes excellent samples, both of the best of our common breeds and of all the imported varieties.

The most striking peculiarity of the occasion, was the union of this agricultural festival with the exhibition of the Middlesex Horticultural Society, and with the fair of the Middlesex Mechanics' Association. Hitherto, for half a century past, the cattle shows of this oldest of all the county societies have been held at Concord, and the occasion has been one of purely agricultural interest. The late festival was held within the limits of the great manufacturing capital of New England, and in immediate connection with extensive and brilliant displays of the products of other branches of industry.

There was felt, however, to be no incongruity in the scene, and the gratified spectator passed along from one part of the exhibition to another, with only a deeper sense of the mutual dependence and common interests of all departments of human labor.

The show of fruits and vegetables was, of course, left to the horticultural halls, in which all that taste, skill, cultiva-

tion and science could accomplish, was witnessed in ample measure.

The exhibition of farming implements was confined to the mechanics' fair, where they were displayed in connection with every variety of curious machinery and exquisite fabric, which American invention and American industry have produced.

An address by the Hon. Linus Child admirably illustrated the great lessons of the day, and an agreeable meeting at the social board afforded an opportunity for the expression of those sentiments of patriotic interest in the promotion of the agriculture and the arts of our State, and of our whole country, which such an occasion could not fail to inspire.

The day was most propitious, and the multitude assembled evinced the interest taken in such shows by the people of the county and of the neighborhood. The presence of a larger number of those interested in agriculture, from other parts of the Commonwealth, was undoubtedly prevented by the fact, that the festival of the Norfolk Agricultural Society took place on the same day. It is hoped that one of the good results of the organization of this board, will be such an arrangement of these festivals hereafter, as will prevent them, as far as possible, from interfering with each other.

ROBERT C. WINTHROP.

Exhibition of the Worcester Society.

In obedience to the appointment by this board, I attended this exhibition on the 18th of September last. As on all former occasions, within my observation, here was presented much to interest and instruct. No county society has done more to aid and enlighten the farmers of the Commonwealth. For thirty years or more, the life-blood of information has flowed hence, as from the heart, and pervaded all the extremities, and the whole community has been greatly benefited by these influences.

By the kind attention of W. S. Lincoln, secretary of the society, I have been favored with a complete statement, (for four

years last past,) of the entries made and animals presented, at their shows. This statement, which is appended as part of this report, will sufficiently explain all inquiries on these points, and be a model, worthy to be imitated by other secretaries. A uniform system of reports, from the several secretaries, would greatly facilitate a knowledge of the comparative condition of the societies, and afford the means of preparing a condensed view of the exhibition of animals and products throughout the Commonwealth.

The ploughing match was the first object that demanded attention. Here were sixteen teams in the field, all single teams of one pair of cattle, without a driver. On inquiry of the chairman of the committee, whose experience is equal to that of any other man among us, I found it to be the deliberate opinion of the trustees of the Worcester Society, that one pair of cattle, without a driver, was a sufficient team for ordinary ploughing, and that it was not necessary or expedient to use more. If this be so it should be known A large part of the farmers, so far as my observation extends, do not adopt this rule of action, in the ploughing of their own lands.

Dry and hard as was the earth in this field, it was apparent that the labor of ploughing was quite too severe for the team employed. By many of the teams the work was done with extraordinary ability, considering the disadvantages under which they labored. My opinion has ever been, that the operation in the ploughing match should be, as far as possible, an illustration of the best manner of operating on the farm, and that the work should go on in such manner, as it might be continued for three hours at least, without special inconvenience to the team employed. Because of the over-exertion on the part of the cattle in this contest, I except to the performance, and not because the work was not done with signal ability.

Among the ploughmen on the field, was a lad of fifteen years only, by the name of Stockwell, from Sutton, who deservedly took a high premium. When boys can thus contend with men, it is time for men to stand aside. What better diploma can the farmer's son take with him, than a certificate

from an ex-governor of the Commonwealth, and a president of an agricultural society of thirty years' standing, that he is one of the best ploughmen in the best county in the State?

Of the stock presented, my attention was particularly drawn to the fine specimens of Durham, Devon and Ayrshire breeds, grown in this county. Very early, fine animals of this description were introduced here, the traces of which are distinctly visible. If I do not mistake, there is no county in the Commonwealth that has been more vigilant in this matter; and judging from the general appearance of the stock in the pens, there has been no mistake in their partiality for these breeds. I forbear to extend remarks upon particular animals, because it will be done with so much more discrimination by the committees whose duty it was to compare them. It is with farm animals as with men, the traits of a good character spread far and wide, and are often to be found long after the originals have ceased to be remembered. With the fine specimens of young stock, presented by that model of good farmers, John Brooks, of Princeton,—with whom has been stationed the State Ayrshire bull,—and which were understood to be the offspring of that animal, I was particularly pleased. Equally well pleased was I with the specimens of stock from the farm of Harvey Dodge, of Sutton, who has in keeping the Devon bull, from the State Society. There is something either in the animals themselves or in the manner of keeping them, that ensures superior stock. This was so conspicuous on a comparison of these with other young stock, that no one could mistake the fact. I would not say that there were not single animals present, that would compare well with any of the offspring of these bulls, but there were no families that would compare advantageously with them.

The exhibition of fruits in the horticultural department of the show was splendid and imposing. Rarely, if ever, have I seen a finer display of peaches. Among these, the Early Crawford was conspicuous, some of the specimens measuring thirteen inches in circumference, and tinged with colors, rivalling in beauty the most charming objects of view. Magnificent pears, and products of the field and garden, evincing luxuri-

ance of soil and fidelity of culture, were exhibited in great profusion.

The products of the dairy, in fine specimens of butter and cheese, also appeared to good advantage. In no part of the Commonwealth, so far as my observation has extended, is the making of cheese more successfully pursued than on the farms of New Braintree and the towns adjoining.

This society, like most others in the Commonwealth, still continues to crowd its operations, at the annual exhibition, into one day. The thought occurred to me, when passing hastily from one object to another,—as was necessarily done,—whether more time could not be beneficially used at these exhibitions. What is worth doing at all is worth doing well. This consideration was more fully impressed on a subsequent visit at the show in Bristol County, which embraced two days, where everything seemed to be done to the best advantage. The conclusion to which I arrived on a view of these exhibitions, as well as those of the society with which I have long been connected in the county of Essex, is, that our agricultural societies, under a proper subdivision of duties, can advantageously make use of two days at their exhibitions. The first, perhaps, in preparatory arrangements and in examinations by the committees; the second, in views by the people and assemblies for mutual instruction.

A reference to the secretary's return, will show that the number of animals presented was quite equal to that of former years. This is highly gratifying, when it is considered that within a short time, several new societies have grown up within the limits of the original Worcester Society, almost rivalling this in magnitude of exhibition. If "he who makes two blades of grass to grow where but one grew before," is entitled to be considered a public benefactor, we can see no good reason why the rule should not apply to societies. Still, we should regret the arrangement that would essentially mar or impair the symmetry and completeness of any of our time-honored associations.

JOHN W. PROCTOR.

STATEMENT OF ENTRIES AT THE SHOWS OF THE WORCESTER AGRICULTURAL SOCIETY FOR THE FOUR LAST YEARS.

	1848.	1849.	1850.	1851.
Ploughing, - - -	13	11	13	19
Bulls, - - - -	9	18	22	17
Bull calves,* - - -		6	9	9
Cows, - - - -	24	19	19	17
Heifers, - - - -	51	62	69	60
Heifer calves, - - -	16	3	6	5
Pairs working oxen, -	21	30	24†	25
Pairs steers, - - -	31	26	30	31
Pairs steer calves, - -	4	2	3	5
Fat cattle,‡ - - -	33	11	20	13
Sheep, - - - -	12	13	6	12
Swine, - - - -	28	24	20	15
Poultry, - - - -	10	15	30	57
Butter, - - - -	9	11	11	11
Cheese, - - - -	14	15	17	15
	275	266	299	311

The entries of sheep, swine and poultry, are of the distinct entries, and give no idea of the number of animals included in each entry. As, for instance, of ewes and weaned pigs, the rules require that there should be not less than four in each lot; of poultry, not less than five; in reality, the number in each lot of pigs frequently exceeds the required number, perhaps as high as ten or twelve.

WILL. S. LINCOLN, *Recording Secretary.*

* No premium offered for bull calves in 1848.

† Seth Wyman offered a team of 25 yokes owned by himself, in this year; no premium had been offered.

‡ There were 23 fat oxen, 7 steers and 3 cows in 1849, but subsequently there has been no premium offered for fat steers.

Exhibition of Worcester West Society.

The county of Worcester is so large in extent, that the outermost towns on her western border are distant from the town of Worcester, where the shows of the county society are held, more than twenty miles. The roads, too, leading thither, are over many hills. So that the driving of animals, especially fat cattle and new milch cows, was a matter of risk, of expense, and of loss of time. Hence, ten towns, Barre, Phillipston, Petersham, Dana, Hardwick, New Braintree, Hubbardston, Oakham, Dana, and one other town, were either unrepresented at the county show, or appeared at great disadvantage, beside the towns less remote.

This whole region of country is celebrated for its fine fat cattle, and for its working oxen and milch cows; its farmers have a laudable desire to exhibit their stock for inspection and comparison, and they determined to erect a new society within the county limits. An act of incorporation has been procured; a large sum of money has been subscribed, enough to entitle them to the bounty of the Commonwealth; a fine lot of land has been donated by an enterprising inhabitant of Barre, and on the first day of October last was held the first show of the new society.

At an early hour, long lines of neat kine appeared on the ground and took their appointed positions for the day. Swine grunted their gratification that they were to be pronounced upon, unsalted and unboiled. The fowls noisily greeted the assembling crowd. By and by, to the sound of spirit-stirring music, a long cavalcade of horsemen and led horses unrolled upon the plain. The Green Mountain Morgan exhibited his unequalled face in the van, and behind him appeared his progeny, fine scions of an illustrious stock. The display of horses attracted universal attention and admiration. At ten o'clock there was a fine trot around the common, open to all comers. Ninety yoke of cattle in fine condition appeared to compete for the premium of excellence; and of these there were but two yoke that would not have been creditable to any farmer. Of swine and sheep, the show was very select, but smaller than

it should have been. A proper enthusiasm in the poultry line prevails, and good specimens were exhibited.

The horticultural exhibition was gratifying to the most sanguine friends of fruits, flowers, and vegetables. In apples, the show was better than any other witnessed by your delegate this season. Of pears, there were good specimens of several varieties, and of vegetables the collection was large and excellent.

One great object of the appointment of delegates to visit the shows of the various societies, is to collect whatever may be found peculiar and praiseworthy in the arrangements of the show visited, and as well to report for the consideration of this board, whatever is, in the opinion of the visitor, of questionable good.

It is the privilege of the undersigned to have seen here much to commend, and little to condemn.

1st. The show of fat cattle was remarkable; and nowhere else, to the knowledge of your delegate, has any one farmer equalled the display of Harrison Bacon, of Barre, who exhibited thirteen steers, that weighed, in the aggregate, thirteen tons.

2d. The arrangements for the show of horses, though not precisely peculiar to this society, is commended for general adoption. A course was laid out, encircling the cattle pens, and at a given hour, previously announced, and well known, the committee on horses took their stand, after having examined the horses in a state of rest, to judge of them in motion. The contest of speed at no time degenerated into a jockey-race, although the competition was at times close.

3d. The articles of butter and cheese, for which this county is famous, were entered by numbers on the secretary's books, with corresponding numbers attached to the boxes and tubs. The committee, in judging of these articles, were thus uninfluenced by the unacknowledged but often potent spell of the previous reputation of an exhibitor. The firmest men are swayed by trifles more than they themselves would desire; and common humanity is governed considerably by fear or favor; and will be, so long as human nature continues to be human nature.

4th. Your delegate finds here one practice that is growing to be an evil, though himself was convulsed with laughter at what he condemns. The report on swine was one of the most irresistibly ludicrous performances, that it has been the lot of your delegate to hear. The report was replete with wit, and was delivered in a most creditable style. So, also, with the report on poultry. The committee on swine, also, were some five or six gentlemen of the amplest dimensions, and were selected with a view solely to their avoirdupois weight in the community. All these things are vastly amusing, but the condition of our swine will never be mended by smiles. Our farmers need good solid information on this subject, and that of poultry. In these two divisions of stock, almost every farmer is a breeder, and the best instruction and advice should be afforded to him by the reports, which are frequently the only agricultural intelligence he receives from year to year.

WILLIAM S. KING.

Exhibition of the Hampshire, Franklin, and Hampden Society.

For more than a quarter of a century, this was the only agricultural society in the valley of the Connecticut. There are now three others, viz., the Hampden Society, the Franklin Society, and the Hampshire Society. The name of the parent society seems almost to be absorbed by her young and vigorous offspring, and yet it is so ancient and honorable that it may well be retained. The only serious evil likely to arise in the case, is, that as the parent society covers the same ground with the other societies, it may happen that premiums may be awarded, from year to year, for the same animals or products by two societies. In multiplying agricultural societies in the Commonwealth, it could not have been the intention of the Legislature to introduce this practice; and so far, at least, as regards the funds given to them by the State, the practice, if it arise, ought not to be encouraged. It becomes all the societies receiving the State bounty, faithfully to dispense it, as, apart

from the duty they owe themselves and the State, it is only in this way they may expect to receive it for the future.

The thirty-third anniversary of this society was held at Northampton, on the 8th and 9th days of October last. The undersigned, appointed as the delegate of the board to attend this anniversary, regrets that he was unable to be present during both of these days. The first day was devoted mainly to the show of cattle and the ploughing match. The latter was contested in a very spirited manner by thirty-three teams, and, as your delegate was informed, all horse teams. Indeed, the use of horses for ploughing, seems to be far more common in the western part of the State than in the eastern, and is more encouraged at their ploughing matches than with us. The show of cattle was said to have been better than that of several former years, but not so good as the valley of the Connecticut should present. From the weight given to your delegate of some of the fat cattle, the shows are decidedly before those on the seaboard in this class of animals. And well they may be, when it is remembered that the range of pasturage in Worcester county, and onwards through the State to the west, is far greater and better than that which is to be found in the east. The middle and western counties are grazing counties, whilst the other counties have but little to depend upon in the grazing of cattle. And here it may be remarked that the old pastures in the State are fast becoming exhausted of their scanty herbage, and demand most urgently the attention of our farmers to renovate them, and the liberal encouragement of our agricultural societies to aid in the work. Had the Legislature, in the general enactments in regard to these societies, provided that this should have been done, it appears to your delegate that more practical benefit would have accrued to the community than from the encouragement of the growth of forest trees, which is the only specific subject taken under the fostering care of the Legislature.

The societies in the valley of the Connecticut have given great interest to their shows, by offering premiums for the largest number of working oxen from any town. Three of these teams were present at the show at Northampton, 30

yoke from South Hadley, 25 from Hadley, and 25 from East Hampton.

With regard to the arrangement of the cattle pens, the plan here adopted has decided advantages; not that it is peculiar to this society, but it is worthy of note in connection with the arrangements for a cattle show. The pens are placed in parallel lines, a couple or more rods apart, and the space between is kept clear, in the first place, for the admission of the animals entered for the show, and, in the second place, for the committees, officers of the society and invited guests, that they may conveniently examine the animals. The masses of spectators have the outside space for their free use and occupation. In such an arrangement, the proper course would be, in labelling the pens with the description of the animals, and the names of their owners, to affix similar labels on both sides of the pens, so that all may have the necessary information. Where cattle pens are arranged in a single line—as is not unfrequently the practice—it is with great difficulty that the committees and those who wish most to examine the merits of the animals, are able to effect their object.

On the second day, it was the privilege of your delegate to witness a fine show of horses, such as only the western societies in the State are able to present. Nearly 100 specimens of this noble animal, which Lawrence, in his Treatise on the Horse, says, next to a beautiful woman is the most beautiful animal in creation, were here assembled as competitors for the awards of excellence. Assembled, not in pens crowded and confined, but, as they passed under the inspection of the committee, trotted out between the long lines of spectators, who, equally with the committee, had a full and fair view of their gait and action, as well as of their different points of merit. An illustration was here furnished of the advantage of the services of the military forces at these exhibitions. By their aid, the lines of the spectators were kept in their proper places, so as to give ample space for the equestrian evolutions. In general, however, the presence of the military on these occasions is, in the view of your delegate, entirely incongruous. As the day is the farmer's holiday, devoted to the arts of peace—to the

art that of all arts most conduces to peace, and flourishes by peace, it is difficult to see the propriety of associating with it the art of war, even in its mildest aspect.

The hall, where were exhibited the fruits and domestic manufactures, is one of the largest and best adapted for the purpose, your delegate has ever entered on such occasions. It is the Town Hall of Northampton, and if the legal voters of that town, at their municipal meetings, bring forth fruits as rich and rare, as were here displayed by its farmers and horticulturists, it must, indeed, be a privilege to be at their meetings. The show of apples was superior to that of other fruits, and was of the highest order. If the apple can be generally grown in the Connecticut valley, in such perfection as the specimens here exhibited, the farmers in that region should engage largely in this branch of husbandry, and with proper skill and care they would be abundantly rewarded. The premiums on fruit, were awarded in sums of considerable amount to the best collections and the largest varieties. The practice, so common with our societies, of distributing premiums for fruit in small sums—sums less than a dollar, even to a quarter fraction of a dollar,—and to every contributor, seems to be at variance with the mode of bestowing premiums in the other departments of an agricultural show. Fifty dollars awarded in ten premiums, would accomplish more good, than if it were divided into fifty premiums, or one hundred. And yet the latter course is the most prevailing one, and thus all distinctions among fruit growers are confounded, and competition so far is paralyzed.

The reports of the different committees seem to be drawn with care, and some of them to possess not a little merit, as literary productions. The reports on fruits and vegetables, made to this society in 1847 and 1848, by the lamented Woodward, are models of their kind, and will long endure, as a perennial wreath, entwined around the memory of their gifted and philanthropic author. Fine writing in an agricultural report, merely to exhibit the author rather than the subject, is not desirable. By no means; and yet careful attention to the drafting of a report ought not to be neglected. It is indeed grateful to a mind of any perception of the just, and true, and

beautiful, to meet with well-executed reports on agricultural topics. The writers of such reports deserve all thanks for the example they set to others; and it is worthy of consideration, whether a liberal premium might not be awarded by all our societies, to the authors of the fullest and best reports that are presented to them. The same remark might be made in reference to the best statement of competitors for premiums.

This society has, for a series of years, made it their practice to secure gentlemen of rare scientific attainments, to deliver the address at their anniversary. They have thus been enabled to reap a rich harvest from the intellectual seed, which is annually, and, as it were, broadcast, sown among them. They were equally fortunate the last year and the present, in having as their agricultural teacher, Dr. Daniel Lee, of the agricultural department of the Patent Office, at Washington. Fortunate will it be for all our societies, when they can obtain such men to address them; more fortunate still, when they shall feel the want of such men, and zealously seek after them. The dignity and independence of the farmer have too long been the theme of our agricultural addresses; too long have our orators flattered the vanity of farmers, and persuaded them to rest satisfied with the improvements already effected in their husbandry. The time is at hand—if it has not already arrived—when agriculture, not as it is, but *as it may be ordered*, must be the subject of discourse; when the means of advancing it, must be pointed out, and the minds of thinking farmers excited to new efforts and higher attainments.

In conclusion, your delegate would state that the address of Dr. Lee was followed, at the dinner table, by remarks of a similar purport,—illustrating and enforcing the necessity of science to the full development of the resources of our soil. The visit of your delegate was to him most interesting and profitable, and he can only regret that from the rich field into which he was sent, he had not brought home to you more sheaves.

ALLEN W. DODGE.

Exhibition of the Hampden Society.

In presenting a report of the exhibition of this society, I have to offer only such information as I could obtain from others who were present. It was held at Springfield, on the first and second days of October, under all the advantages of pleasant weather and facility of access to that flourishing town. Never, it is said, was the county of Hampden better represented, at any former exhibition, in number or quality, by men and women, and animals, vegetables and articles of domestic manufacture. Young men and maidens, old men and children, from different parts of the county, members of the society and transient visitors, spent two delightful holidays, in a manner appropriate to the high character of the community, and to the purpose for which they had come together.

There were 82 entries of horses; 17 of bulls; 12 of milch cows; 26 of heifers; 49 of working oxen; 18 of steers; 20 of fat cattle; 20 of sheep; 26 of swine; 60 of fowls; 16 for the ploughing match; 35 of butter, cheese and honey; 18 of bread; 300 of vegetables; 298 of fruits and flowers; 76 of domestic manufactures; 28 of mechanic arts; 4 of farming tools; 20 paintings and daguerreotypes; 45 of children's, and fancy, and worsted work; 1 of tobacco; 10 orchards; in all, 1179 entries.

This enumeration is of itself sufficient to show that the spirit of agricultural improvement is awake in Hampden, and, as compared with past years, is gathering force, promising, in time, to possess the whole county.

The arrangements made by the directors for the accommodation of the numerous animals, and the articles generally, appear to have been judicious and satisfactory. The oxen and cattle generally were excellent, both in size and beauty of form, and fully sustained the credit of old Hampshire in general, and Hampden in particular, distinguished as they have been for fine cattle. One pair of oxen weighed 5000 pounds, and there were twelve head that weighed each from 2200 pounds to 2500 pounds each. A number of very fine cattle were from Westfield. Some of the milch cows were uncommonly good. The one

entered by Amos Carlton, of Chicopee, in twenty-six weeks, gave 2266⅔ quarts of milk, exclusive of the feed of the calf, at a net profit, including $5 50 for veal and skin of the calf, of $63 67. The show of horses was highly creditable to the society. This was especially true of the geldings and the carriage horses generally, both in respect to number and quality.

Of fruits, there were 208 entries, while last year there were only 80. Among them were fine varieties of the apple, the pear and the peach. It is extremely gratifying to mark the increasing attention that is paid to this class of productions, beautiful as they are to look at, delicious as they are to the palate, and serving as they do to make home attractive. The vegetable department is spoken of as worthy of all praise. The vegetables were arranged in bushel baskets, in triple rows around the hall, and made an imposing appearance. Some of the parsnip roots were said to be about three feet in length. A single squash vine was exhibited, having on it sixteen squashes, weighing in the aggregate 700 pounds. Some of the finest specimens of vegetables were furnished by cultivators in West Springfield.

It remains for me only to add, that the address by Professor Norton, of Yale College, was worthy of the occasion and of the high reputation of the speaker.

At the next fair, "may I be there to see."

W. C. FOWLER.

Exhibition of the Franklin Society.

The fair of this society was held in the beautiful and flourishing town of Greenfield, in the fertile valley of the Connecticut river, on the 15th and 16th of October. Both days being remarkably fine, thousands were attracted to the scene. At 10 o'clock on the morning of the first day, there was a superior display of neat stock, on a beautiful field selected for that purpose, in the vicinity of the village. The number of large and well-formed bulls, and of fat oxen, was very great, whilst farm stock of every other description was all well and ably represented.

But nothing so much pleased us, or attracted from others so much attention, as the long and splendid concatenation of ox-teams from Shelburne and Greenfield. That from the former place being, in the language of the committee on that subject, "the finest, heaviest and best matched, in form and color, of any team ever shown in Massachusetts." Concurring most fully in this opinion, and deeming the beautiful and majestic appearance of these animals as presenting one of the finest features of the exhibition, we cannot refrain from earnestly recommending the example of these towns to the favorable consideration and adoption of other agricultural districts in the Commonwealth.

At the trial of working cattle, on the same day, in the street leading to the depot, such loads were drawn as very clearly evinced the admirable training and muscular strength of the animals, to the great satisfaction of a multitude of spectators.

The ploughing match came off in the afternoon, and was uncommonly successful. The field selected for this operation, was of a stiff clay soil, but of a smooth and even surface. Arriving on the spot with a number of other gentlemen, at the appointed hour, we were detained a long time before the teams started. To many of the spectators this was not agreeable, and were we to mention any circumstance connected with this part of the exhibition, not precisely in accordance with our own taste and judgment, it would be the fact that there was too much delay in making the preliminary arrangements, after the time assigned for the commencement of the work. But this delinquency is not uncommon in other societies. It was probably unavoidable here. Twenty-four entries for the ploughing had been made—eighteen competitors were in the field. The teams, taken as a whole, were by far the finest we ever saw, being mostly single ox-teams, of great size, strength and beauty. The committee awarded the premiums, irrespective of the precise depth of the furrows, the same being from six to eight inches deep. The Michigan, or Double Plough, was also operated, and received many encomiums from the farmers present, as an implement likely to be of great utility. And to crown the whole, a plough, manufactured by Prouty &

Mears, was found to work well without the aid of human hands, and finally eclipsed all the achievements of its "illustrious predecessors."

At the late ploughing match of the Bristol County Society, it was observed that the last furrow of each of the lands ploughed, was, by the direction of the committee, left standing, without being cut or inverted; while here in Franklin county, great pains were taken to have the last furrow smoothly and nicely turned. We are compelled to say that, in our judgment, the practice of our friends in Franklin is far preferable to that referred to in Bristol.

On the second day, horses were the only stock exhibited. The display was on Maine street, which is very wide and spacious, and no part of the exhibition attracted more attention than this. Instead of being confined in pens, as is the practice at the shows of most other societies, these noble steeds were driven at full speed by their owners. As they were of all descriptions and colors, we were quite sure that no one, however fastidious might be his taste, could have failed to be pleased, and to exclaim with king Richard III, "A horse! a horse! my kingdom for a horse!"

In contrasting this with other festivals of the kind, we saw much, very much to approve and admire. The custom of the Franklin Society of having all the members of committees designated by an appropriate badge, we highly approve, and from what we saw, we are also convinced that where it is deemed advisable to have an agricultural fair occupy two days, it is preferable to have the ploughing match on the first day, as was the case here, than on the second, as, by way of experiment, was the case in Bristol. Persons coming from a distance to attend the show of stock on the first day, can thus be present at the ploughing match, also, with the same animals, and allow them to be returned home on the same or succeeding day.

The address of Professor Norton, at the church, and the remarks made by different gentlemen at the dinner table, seemed to be directed to the discovery of the best means for the promotion and advancement of the science of agriculture and agricultural education. We will only add, in conclusion, that our

visit to the county of Franklin will long be remembered by us with pleasure, as among the most agreeable events of our life.

JOHNSON GARDNER.

Exhibition of the Hampshire Society.

In pursuance of the duty assigned, to visit the Hampshire Agricultural Society, your delegate proceeded to Amherst, where he met with a cordial reception and was most hospitably entertained during his stay. Every facility was afforded by the government of the association, for examination of all departments of its extensive and interesting exhibition. The excellence and variety of the contributions, were gratifying and encouraging. The whole show was honorable to the society, especially to the officers and committees, upon whom devolved the laborious duties of superintendence.

It was particularly cheering to all, who have at heart the advancement of agriculture, to witness the large number of professional gentlemen, for which Amherst is so celebrated, coming forward with a helping hand, and coöperating with the intelligent farmers of Hampshire county, in behalf of an institution for the promotion of that most important and useful pursuit, the culture of mother earth.

Located as the Hampshire Society is, in the immediate vicinity of one of the colleges of our beloved Commonwealth,—a college celebrated for its attention to the natural sciences,—and in the valley of the Connecticut river, where the soil is remarkably productive and well adapted to the raising of cattle and of agricultural products, there can scarcely a doubt arise, that the Hampshire Society will at once take and easily maintain an elevated rank among kindred institutions. In truth, high as were our expectations, the society's exhibition very far surpassed them.

It was, also, a source of great satisfaction to notice the lively interest manifested by the ladies—not only the wives and daughters of the farmers, but of other classes—who, as repre-

sentatives of female industry, graced the exhibition with the beautiful fabrics of woman's skill and taste.

At the various points of interest, the number of visitors was large. The halls set apart for the display of fruits and flowers, the dairy, domestic manufactures, and agricultural implements, were thronged during the day; all anxious to participate in the triumphs of art and in the success of the society.

The first object, which attracted the attention of your committee, was the long procession of working cattle, composed of "town teams," occupying a large portion of the spacious common. The most extensive of these was the *string from Belchertown, numbering two hundred oxen in pairs*, and attached to a car, ornamented with banners, containing one hundred and eighty intelligent farmers and an excellent band of music. There were long strings from the towns of Granby and Leverett, and a private team of nine yoke, from Hadley, the whole making a grand display of nearly four hundred working oxen. These were generally in fine order, of good size, and well proportioned. Some pairs were nicely matched, a pleasing and important feature, whether we have regard to fancy, usefulness, or value.

Your committee noticed, also, about sixty steers in pairs, some of which were superior; also some good specimens of full blood and grade stock; and a very respectable delegation of bulls, milch cows, heifers, and calves, which purported to be of "Native American" origin. The whole number of *neat cattle* on the common, was five hundred. The display of horses was extensive. More than one hundred specimens occupied the stations assigned to them, and gave general satisfaction. Although there were few animals of high grade, yet there were some superior beasts; which indicated that attention had been bestowed on their breeding, and that commendable efforts are in progress for the improvement of the noble horse. In the poultry department, were six hundred specimens, many of them of improved varieties.

The pomological department was very well represented, particularly with apples. The display consisted of more than four hundred plates. Many specimens were of the most popu-

lar varieties in cultivation, and which, for size and beauty, could hardly be surpassed in New England. We were happy to learn, that an increasing interest prevails among the farmers of the Connecticut valley in the culture of fine fruits. The perfection and general excellence of those on exhibition, indicate that Hampshire county could make this branch of cultivation successful and profitable.

The ploughing match, always a scene of interest and excitement, was witnessed by a large number of spectators. There were about twenty teams, which entered the list for competition. The land was rather stiff and stony, well adapted to try the skill of the teams. The work was remarkably well done under the circumstances; some of the ploughmen managing with great ability and skill.

We noticed here, as well as at the exhibitions of other agricultural societies, the Michigan sod and subsoil plough. It resembles, if it is not identical with, the *plough of Morton*, described in a recent French publication, in possession of President Hitchcock. This plough, in the opinion of your committee, is worthy of all the commendation which has been bestowed upon it in this country. From personal experience, and from an opportunity of witnessing its performance, your committee recommend it, as worthy of adoption by every farmer. The Michigan plough is constructed with two shares; one in advance, turning over the sod; and the other covering it with the lower soil. This process exposes to the beneficial influences of the atmosphere, the inorganic substances of the subsoil which are thrown up; and by covering the sod, prevents the escape of the fertilizing gases, during its decomposition. For turning in of grass lands and stubble, this implement is considered one of the most important that has recently come to notice.

Your committee would not omit to mention that indispensable part of the exercises of the day, the annual dinner. This was attended by about three hundred ladies and gentlemen, who sat down to tables abundantly spread with the fat things of the land, and ornamented with the offerings of Flora and Pomona.

Your committee is convinced that this society is destined to maintain its prominent position among kindred societies. The Hampshire Society has many natural advantages; great facilities for the acquisition and diffusion of scientific information, and its members display remarkable activity and enterprise.

Your committee, therefore, congratulates this board, on the addition of this promising member to the agricultural family.

MARSHALL P. WILDER.

Exhibition of the Berkshire Society.

According to appointment by the Massachusetts Board of Agriculture, the subscriber, in September last, attended the annual agricultural fair of the Berkshire Society, at Pittsfield. This society was the first incorporated in this Commonwealth, and is among the oldest in this country; Pittsfield and the adjoining towns may be reckoned with the best farming districts in the State. These towns are surrounded by mountains, giving, in a clear September day, a fine panoramic view. Your committee was induced to stop by the way, and witness part of the exhibition of the Hampden Society, at Springfield. By this delay, he regrets that on his arrival at Pittsfield, he found most of the live stock had left the show ground; but those which remained, oxen, sheep, swine, and fowls, gave evidence that the exhibition in this department must have been excellent.

The ploughing match was commenced early on the second day of the exhibition. The morning was fine, and multitudes in carriages and on foot, preceded by a fine band of music in an open carriage, repaired to the field appropriated for this trial. The teams, with a few exceptions, were fine in appearance, both oxen and horses. The spectators gave ample room for the trial. The marshal of the day preserved excellent order, and gave, in a clear voice, the directions to be observed. There was no urging of teams,—no noise,—all was done by old whipsters, or without the lash. The ploughs were from our best manufacturers, and the work was well executed. The plough

that attracted the most notice, was the Michigan sod and subsoil plough, held by Dr. Reed, of Pittsfield. Your committee observed, that at this show, the judges on ploughing were selected from out of the county, as far as practicable.

The trial of single and matched horses, gave quite an interest to the show of the society.

The exhibition at the hall, of household goods, of fine butter, cheese, honey, maple sugar, grass seeds and agricultural implements, together with the excellent display of fruits, was much admired.

After the delivery of an excellent and practical address by Marshall P. Wilder, the awards of premiums were read and paid off on the spot to the successful competitors. Your committee would remark here, that in front of the desk, on a table gently elevated on one side, were exposed to the full view of the assembly, in a most tempting manner, the silver plate to be distributed to the numerous winners.

On the whole, your committee found much here to admire, and that can be imitated with profit by other societies. He only regrets that he was not earlier on the ground, so that he would have been able to make a fuller report. He is strongly impressed with the belief that from these interchanges of visits, and a better knowledge of the practices of the various societies, together with a free interchange of opinions at such gatherings and at all meetings of our farmers, as also from our new bond of union, the Massachusetts Board of Agriculture, much may be expected to gladden the hearts of the tillers of the soil.

BENJN. V. FRENCH.

Exhibition of the Housatonic Society.

The first feature presented by the Housatonic Society, is the ardor and enterprise of youth tempered by the judgment and discretion of mature years. This society is comparatively young, but many of its members have been for years active members of the Berkshire Society, and, as would have been expected, have carried many of the characteristics of the old society to the new.

Two days are devoted to the exhibition. All animals, all agricultural productions and fruits, all manufactured articles, and indeed everything offered for premium, are presented on the first day and examined by the respective committees. At the close of this day, all animals may, if their owners choose, be taken away.

The second day is devoted to the ploughing match, which is held in the morning, and subsequently to the anniversary address, reports of committees, distribution of premiums, &c. The premiums are paid in silver plate, and distributed by the marshals of the day to the successful competitors, as their names occur in the reading of the reports by the secretary. This method of presentation, this kind of public coronation of the victor, doubtless has its legitimate influence.

This society always presents a good show of animals, particularly of cattle. The exhibition in this department would not suffer by comparison with those of former years. The fruit department is rapidly increasing in interest. Until one year since, it had not been considered worthy of a distinct committee, but was made an appendage to the duties of the committee on butter and cheese. At that exhibition, the amount and variety were so large, that a committee was appointed at the time, and at the subsequent annual meeting in the winter, fruit was made the subject of a distinct committeeship. At the present show, a convenient room was devoted exclusively to the horticultural exhibition. The display of vegetables was finer than usual. The number of specimens of seed corn, and of grain and grass seeds, was large and the quality excellent. This is, in our view, one of the most important items in an agricultural exhibition, and one which the Berkshire Societies would do well to encourage by increasing both the number and value of the premiums. We would make the same remark in reference to agricultural implements, whether manufactured in the county, or purchased out of the county and kept in it for sale. The progress of agriculture is deeply indebted to the improvement in implements, and any course a society can take, within the bounds of their resources, to secure still further improvements, will bring a rich reward.

The Berkshire Societies, as it appears to us, deal too much in results, too little in causes. Their reports tell us who has raised the best corn, and who the best wheat and rye; who has exhibited the best cow, and who the best oxen. This is well, but it is not enough. A large part of the premiums given to a successful competitor, is given for diffusing the knowledge which will aid another person in producing another specimen like it. But this seems to be forgotten. The "what kind was it?" and the "how was it produced?" are left out. There is nothing tangible. The unsuccessful competitor and all the rest of the world, are sent back to their farms, to feel their way with such lights as their own observation and experience have given them; whereas they are entitled to all the light the recipient of the society's bounty can give. If a premium is offered for an essay, not only must the successful production be given up and become the property of others, but it must be published to the world. We would not take the farmer's wheat and distribute it among others, but we would take the knowledge by which it was raised, and scatter it broadcast through the land; and if he would keep his *knowledge*, we would keep the *silver*. In reference to crops, there is always time enough for the producer to make his statements, and the committee their report, and if omitted there is no excuse for either.

From those committees, whose work is on the show grounds, where the entire afternoon must be spent in looking, and whose report must be presented to the secretary, the next morning, not very much, under present arrangements, should be demanded beyond the award of premiums and the grounds on which it was made. Absence from home and books, the noise and bustle of a public house, and all the concomitants of a cattle show, are, to the quiet farmer, not conducive to the preparation of documents of great accuracy; and reports prepared before the specimens to be reported upon are seen, and kept on hand, —as Cicero is said to have kept the introductions to his orations,—ready, with slight modifications, to be prefixed to an award on horses, hogs, or hens, are esteemed but lightly. They usually deal largely in "dewy lawns, and sparkling gems, and meandering brooks, glowing under the effulgence of the pale

moon," and are, to say the least, no better than moonshine, to aid the farmer in raising pigs or poultry.

But no such difficulties attend the exhibitor, and every entry of an animal for premium, should be accompanied by a statement of his age, breed, and manner of being fed and used. All such statements, with those on crops, fruits, and other products, should be preserved and subsequently printed entire, or the information condensed and given in a tabular or statistical form. By this course much valuable information would be elicited and gathered, to be scattered far and wide.

S. REED.

Exhibition of the Norfolk Society.

I attended this exhibition at Dedham, on the 24th of September, 1851. When I arrived there, the streets were filled with people, men, women, and children, all moving in one direction. Everything indicated that the day was one of great interest and excitement. Upon proceeding to the scene of action, I found that the ploughing match was nearly ended, many teams having already accomplished their work. From a hurried examination, I got the impression that much of the work was performed with a creditable degree of skill, but I have seen fields which, as a whole, were better ploughed.

The pens for animals were admirably arranged, easy of access, and being erected on the borders of the lot, afforded sufficient space for the circulation of the immense crowd of eager and interested spectators. The specimens of neat stock were numerous, and, in many cases, of excellent quality. The Alderneys, exhibited by Thomas Motley, Jr., of Roxbury, and others, were to me a new and most interesting feature of the exhibition, and attracted general attention and admiration. A large proportion of the cows at the show, were pure blood stock. The horses and colts were neither numerous nor remarkable. The exhibition of swine was of a high character; among them were many superior animals of the Suffolk breed. The show of poultry was said to be very large, but I had no opportunity to examine it.

The fruits, flowers, and vegetables were exhibited under a vast tent, or rather, under a tent which would have seemed vast, but for the crowd which thronged it. There were various articles attesting the taste and skill of the fair daughters of Norfolk, but the throng of visitors and lack of time prevented a particular examination. I did not notice many articles of manufacture other than those of a domestic character. The prominent feature of the exhibition was the fruit. The president, at the dinner table, said, in substance, that in several respects, no exhibition of fruits in the world could surpass theirs of that day. That was, I think, no vain boast, but plain prose. Quantity, variety, and quality, all considered, I have never seen it equalled.

At the appointed hour, a procession was formed, to proceed to the church, to hear an address from George R. Russell, of Roxbury. The procession was formed and marshalled with greater order and decorum throughout, than I have ever witnessed on a similar occasion. I listened with deep interest and delighted attention to words of wisdom, seasoned with most polished wit, and thought the hour most pleasantly and profitably spent.

After the address, the procession was re-formed, and the society and its guests repaired to the appointed portion of the tent, where about one thousand persons, ladies and gentlemen, with merry and thankful hearts, partook of the good things so abundantly provided. At the table, as elsewhere, beaming faces, good cheer, hearty and unceremonious welcome, and thankfulness to the God of the harvest, prevailed. Speeches were made by the venerable President Quincy, and other gentlemen.

All orders of men, and women too, seemed to conspire to make the day of exhibition an occasion of real improvement and thanksgiving. The early and accomplished pioneers and fathers of husbandry and of horticulture in the county; young agriculturists and horticulturists, in the first flush of enthusiasm, pressing forward to fill the places of their seniors; professional men of every class, as well as out-and-out farmers, and their wives, and all their lads and lasses, seemed to enter ear-

nestly into the spirit of the occasion, and to vie with each other who should most heartily contribute to make the day one of pure enjoyment.

Time only was wanting. There was, in some things, hurry, if not confusion. That society, like others, needs more than one day for its exhibition. The youth of the Norfolk Society promises excellently well. I can only say to it, in Roman phrase, "Macte virtute esto;" may it go on as it has begun.

J. H. W. PAGE.

Exhibition of the Plymouth Society.

In accordance with a vote of the board I attended the late annual fair of the Plymouth County Society, and transmit to you a very brief account of such parts of the exhibition as fell under my observation.

It was noon when I arrived at Bridgewater, where the fair was held, and I was consequently deprived of the pleasure of witnessing the proceedings of the first part of the day. Having no further time to lose, I immediately visited the *cattle pens*, and was much gratified to see a handsome collection of *native stock*, which, if not distinguished by the marks and superior external beauty, which are peculiar to some of the imported breeds, impressed me with the belief that they had not suffered for the lack of kind care and good feed. The *cows* looked homely in shape, but that they were cows of "quality" I shall have occasion to show further on. The *working oxen* performed very well, and were in fine condition, but I despair of witnessing anywhere such capital performances as are usually to be seen, in this department, at the *Worcester* exhibitions.

The extensive show of *fruits and vegetables* quite surprised me. The variety of garden fruits was not as great as we bring out in Norfolk, but the apples and quinces far surpassed my anticipations. These staple fruits are evidently in high estimation in Plymouth county, and the specimens exhibited were as free from blemish as the best New York varieties. The veg-

etables—especially the roots—were fully equal to the same products of Roxbury and Brookline.

But there was one feature of the exhibition which is worthy of special notice, and had I witnessed nothing else, would have fully repaid me for my visit to Bridgewater. I mean the noble display made of the products of the *dairy*. In this department the industry and skill of the women of the Old Colony were shown to the highest advantage. In no truer way either can the good management of the farmer be tested than by the condition of the dairy. If the exhibition of butter and cheese of the Plymouth Society this year, compares with the average annual show, then the native cow of Massachusetts, with huge head, body and horns, is a superior producer, and can be made to turn out butter as generously, and as rich in color and quality, as is brought to us from the green valleys of Vermont.

The display of ornamental and manufactured articles was very extensive, and many of the specimens of female taste and skill were equal to any I have elsewhere seen. Doubtless much of the success of our agricultural societies is owing to the share taken in the exhibitions by the ladies; and the Old Colony Society is entitled to a full share of credit in this respect.

The annual address before the society, by our distinguished fellow-citizen, Mr. Teschemacher, was delivered before I reached Bridgewater. High encomiums were passed upon it by several who had the pleasure of listening to it.

I have to acknowledge the kindness of Hon. Philo Leach and Jacob Perkins, Esq., who accompanied me to the various divisions of the show, and secured to me every facility for deriving pleasure and profit by my visit.

EDGAR K. WHITAKER.

Exhibition of the Bristol Society.

I will briefly state my recollections of the exhibition of this society, which was held at Taunton on the 9th and 10th days of October last.

The first peculiarity was, the occupation of two days. On the first day, all animals and articles were presented and arranged for the examination by committees. The society met in the afternoon, and attended to the usual business of the annual meeting. Everything went on with order and propriety. The only thing in the arrangements, that occurred to be amended, was, that no provision was made for keeping the animals on the ground, over night. This seemed to be very desirable, as most of the visitors to the show were expected on the second day; and as a loss of a view of the animals presented, would materially detract from the interest of the show.

On the second day, operations commenced with much activity, on the ploughing field, there being thirty-six teams actually engaged. Among these were teams of two pairs of oxen, one pair of oxen, one pair of oxen and a horse, and one pair of horses. It was particularly gratifying to witness this variety of teams, for, so long as teams of these several descriptions continue to be employed by good farmers, it seems highly proper to give each of them a chance in the competition. It was pleasing to find every variety of plough, as well as of team; and, as a whole, I do not remember to have seen a ploughing match,—and I have seen many,—that was carried through in a manner more instructive. Without knowing the opinion of the committees, my own impression of the best performance on the field, was a lot in the extreme eastern part of the field, ploughed by a span of horses, attached to a Michigan sod and subsoil plough, and guided by the ploughman himself. Rarely is seen, work more thoroughly or expeditiously done. This plough may be commended to the notice of all those farmers, who are desirous of pulverizing their soil thoroughly, in the least time.

Next came the trial of working oxen, in the usual manner. It appeared to be well conducted, but not witnessing it through, I forbear to enlarge upon it.

In the hall for manufactures, fruits, and other articles, was a highly gratifying display. The workshops of Taunton and New Bedford, here exhibited almost every variety of mechanic industry, many of which would have shown to advantage, even

in the Crystal Palace, at London. Here, for the first time, I saw a complete display of the apparatus used in the whale fishery, by the aid of which so many millions are annually added to the resources of the Commonwealth. Herein, we see an illustration of Yankee ingenuity and perseverance; what it cannot raise from rugged rocks and sandy plains, it will not fail to command from the depths of the ocean. So true is it, where the spirit of freedom prevails, man fails not to go ahead.

In the halls was to be seen a large variety of the products of the dairy, in the form of butter and cheese, of superior quality. Where the feed grew that produced such fine products, is better known to those familiar with the county, than to those who have observed it only upon the line of their rail-roads. The tables also were loaded with an abundance of the various kinds of fruits, from many of the farming towns, and particularly from the splendid gardens of New Bedford. And what is worthy of all praise, these fruits were offered, on condition that they should be used at the dinner-table, so that all might taste, as well as see, the quality of the fruits. This being done, and the facility of growing them being explained, at the same time, to be in the power of every proprietor of the soil, the consequence will be, that many of these proprietors will, ere long, grow a sufficiency of such luxuries for their own consumption.

The formal address, the usual accompaniment of our county agricultural exhibitions, was wanting on this occasion. But its place was well supplied by appropriate remarks from his excellency the Governor of the Commonwealth, and other gentlemen of distinction present. Nevertheless, it is well to have an annual address at these exhibitions. It gives opportunity for a display of talent and a condensation of information, which, when distributed among the farmers, in connection with the reports of committees, is instrumental of much good. If other counties of the Commonwealth, in proportion to their natural advantages, would do as well as Bristol has done, they would have no cause to be ashamed of their condition.

JOHN W. PROCTOR.

Exhibition of the Barnstable Society.

The annual cattle show and fair of this society were held at Orleans, low down on the Cape, on the 8th of October last. The weather was very fine and a large concourse of people, some from all the towns of our long and narrow peninsula, attended. About 600 persons, one half of them ladies, dined in company at Higgins's hotel; and probably 1500 spectators in all, were upon the ground. It was the first time the fair had been held on the Cape, below Barnstable; and the occasion showed, that among the people of the more sterile portions of the county, there was a lively interest in the success of the society, and the cause of agriculture.

The ploughing match was the first thing attended to in the exercises of the day. The number of ox teams was not so large as usual, the farmers of this vicinity depending mostly upon horse-labor for their farm work. It was well sustained, and attracted, as usual, much attention. The exhibition of stock, particularly of colts, was more extensive and better than on any previous fair, and such as would do credit to any county in the Commonwealth.

There was a very good show of fowls, which was a new feature in our exhibitions; among these the Shanghae and Cochin China predominated. Of fruits and vegetables, were good specimens of almost all the varieties of the season. The dairy was not so well represented, though there were several good samples of butter.

The articles of domestic manufactures, which were numerous and received the greatest share of attention, were displayed in the Rock Harbor Academy. The room, as on other occasions, was quite too small to exhibit the articles to advantage. In this department were several new articles introduced, shell monuments and vases of very tasteful design and workmanship, crayon and other drawings, very beautiful. While there was no lack of the usual quantity of fancy articles, of worsted work and embroidery, the more substantial and useful products of female labor, carpeting, hearth-rugs, coverlets, counterpanes, blankets, cotton and wool cloth and hosiery, occupied a prominent place.

Specimens of the cranberry exhibited, deserve particular notice. It may be doubted whether larger or better specimens of this fruit were found anywhere in the State. The cultivation of the cranberry is, in some towns of the Cape, the most important branch of agricultural enterprise. Fifty bushels, a sample of which was exhibited, were raised on a quarter of an acre of land in Harwich, and were sold for three dollars per bushel. Large tracts of peat swamp are being rapidly converted into cranberry lots by covering the turf with white sand, and setting the vines in hills, one and a half feet apart.

There is on the whole, an increasing interest in this anniversary, and the cause of agriculture generally, upon the Cape, and our experience seems to prove, that the holding of the fair in different places in the county, tends to promote that interest.

The address by Judge C. E. Potter, of Manchester, N. H., was delivered at two o'clock, in the open air, from the rising ground in front of the Methodist church. It was a very sensible and practical discourse. The speaker contrasted the early days of New England agriculture, when the colonies were sometimes obliged to obtain corn from the natives, to prevent starvation, with the present agricultural operations. He went into a description of soils, pointing out the peculiarities of that of Cape Cod, giving some of his own experience in the adaptation of soils to certain vegetables.

He spoke of the farmers of our country as ever having been the true patriots, and always found on the side of good government and opposed to outbreaks of passion, pride or ambition, that have occasionally disturbed the peace and prosperity of the country.

OBED BROOKS, Jr.

THIRD MEETING OF THE MASSACHUSETTS BOARD OF AGRICULTURE.

The board met, according to adjournment, at the State House, in Boston, on Tuesday, February 3d, at 10½ o'clock. There was a full meeting of delegates, all the societies but

Berkshire, being represented. Marshall P. Wilder, the President, in the chair; William S. King, Secretary, *pro tem.*

The several committees, appointed at a previous meeting of the board to report on ploughing, stock, farms, crops, and manufactures, presented their reports, which were accepted. These reports will be found at the close of the account of the proceedings of this meeting.

On a motion to print the reports and transactions of the board, an interesting debate ensued, in which many of the delegates participated, and it was

Resolved, That the executive committee of this board be instructed to confer with the Secretary of the Commonwealth in regard to the publication and circulation of their proceedings, and to make such application to the Legislature in relation thereto, as may be deemed expedient.

Resolved, That the executive committee be also instructed to take such measures as they may deem expedient, to secure a more general circulation of the Abstract of Transactions of Agricultural Societies, published by the State.

On motion of Mr. King,

Resolved unanimously, That the executive committee be authorized and instructed to make arrangements with Professor Fowler, a member of this board, who is about to embark for Europe, to procure from him a report on the agriculture and agricultural institutions of the countries he may visit.

The President presented to the board an extract from the minutes of the Pennsylvania State Agricultural Society, which held its session at Harrisburg, January 20 and 21, recommending the calling of a convention of agriculturists of the United States, to meet at Washington, at some day hereafter to be fixed, and the choosing of a delegate from each Congressional district, to be a member of such National Society.

The following preamble and resolution were offered by Mr. Daggett, and adopted :—

Whereas, This board, at their last meeting, held on January 14th, passed a resolution proposing a National Convention; and whereas, they have received a communication from the State Agricultural Society of Pennsylvania on the same subject:

Resolved, That said communication be referred to the President of this board for further consideration and correspondence.

On motion of Mr. Sprague,

Resolved, That the executive committee be charged with the duty of

making such recommendations to the various County Agricultural Societies, with regard to premiums, as they may deem expedient.

Resolved, That the matter of calling a future meeting of this board, be referred, with power, to the executive committee.

Afternoon Session.

The board met, according to adjournment, at a quarter past 3 o'clock, P. M., in the hall of the House of Representatives.

The President read an interesting letter from Dr. Lee, on the subject of a National Convention; warmly commending the project, and promising the concurrence of several States.

A document from Hon. Abbott Lawrence, Minister to London, regarding the National Agricultural Institution of Versailles, addressed to Marshall P. Wilder, was presented to the board by the President. The document was ordered to be accepted, and referred to the executive committee, and the President was requested to convey to Mr. Lawrence the thanks of this board for his attentive kindness, and for his sympathy with the objects of its organization.

The resolutions on agricultural education, presented at the last meeting of the board, were read and offered for discussion.

Mr. Wilder, in submitting these resolutions, remarked that it was a most extraordinary fact, that while the aid of science has been invoked to all other callings, and while it has been extended to the other interests of the State and country, by the National or State governments, to this day not a dollar directly has been contributed by our National Government to aid this most important interest of agriculture. What we want now is an institution to educate young farmers for their calling. He closed by reading an extract from Dr. Lee's letter, in favor of some such means as is proposed by the board, for the promotion of a thorough and scientific agricultural education.

Mr. Wheeler, of Framingham, spoke of the low ideas which existed in his younger days, in regard to the education of the farmer. It was thought if a boy learned to read, write, cipher, and spell, he would make an excellent farmer. Too much of this want of education exists at the present day, and farmers are too willing to go on in the old way of their fathers. He

showed, by alluding to Belgium and other European countries, that Massachusetts, under a similar system of scientific agricultural practice, might be made to produce a much larger amount of breadstuffs than she now does. He was decidedly in favor of encouragement to agricultural education.

Mr. Dodge, of Hamilton, discussed the application of science to agriculture, showing that this application is practicable. Alluding to agricultural science, as developed in Europe, he contended that the same great principles are applicable in this country. In England, science is recognized as a useful ally. Chemists are employed to analyze soils and to recommend treatment. They err sometimes, but the balance of good is in their favor. The English are a wide-awake people, and from the fact that they unanimously adopt scientific agriculture, he would be willing to follow their lead.

The science which answers for England, it is said, will not answer for us. Why not? The same sun shines on land there, and the same rain descends; the same crops grow there, and science is the same there, as here. The question is, then, why is not this science shown to our farmers? The great reason is, that there are not men enough here to teach it. There are a few men qualified for this duty, such as Dr. Lee, Professor Norton, and some few others, but they cannot be expected to experiment, uncompensated, for the benefit of others. Here, then, is seen the need of aid from the State, to extend the science of agriculture to the farming community. He hoped the day was not far distant when Massachusetts would contribute at least a pittance to carry out this object.

An agricultural bureau at Washington should be established. Let agriculture go up before the Federal and State Legislatures; —go, though reeking with sweat from the plough,—let commerce stand by for a day, and manufactures wait awhile, until agriculture's voice is heard demanding this aid. But he would not wait for this. The states should go on and establish agricultural bureaus for themselves, in order that they may collect statistics to be forwarded to the national bureau when that is established. He hoped that the friends of this movement would persevere in their work until their claim is allowed.

Mr. Gorham, delegate from the Hampden, Hampshire and Franklin Society, next spoke. He said he saw in the community a prevalent apathy in regard to this subject, in the continuance of which he foresaw great evils to the State, if not to the race. The dependence of all other interests upon agriculture he dwelt upon, and said that when *it* suffers all others suffer, when *it* fails all others fail. And yet the position of this cause, in a national point of view, is most sad and humiliating. It was useless to say that this cause would take care of itself. It would not. The calling has to do with the great mysteries and laws of nature, and you can no more expect agriculture to flourish without knowledge than you can expect religion to flourish separated from the practice of virtue and morality. What science has done for commerce on the ocean, she has yet to do for agriculture on the land. The ocean was once a barrier between countries. Timid voyagers crept from headland to headland. Science furnished the trembling needle that always pointed to the pole, and the barrier became a highway. Why will not science, if permitted, do as much for agriculture. The American farmers are looking anxiously for some guiding star to direct them in their calling. He believed that star had risen; that its glimmerings can be seen, and that with faith in it, it would lead to glorious results.

Professor Fowler, of Amherst, inquired, why at this day there should be any doubt of the value of education as applied to agriculture? Especially, why should this doubt exist in Massachusetts? One reason, he believed, is that the advocates of agricultural education are not distinctly understood in their principles or purposes. It was not true that science, in its application to agriculture, was independent of labor and capital. Mere book knowledge is not better than practical knowledge drawn from experience, and the friends of this movement do not entertain or sustain any such theory. Science, without common sense, will not succeed. What they mean, is, that science, *with* common sense, energy, and practical experience, will accomplish the desirable results at which they aim. He supposed a young man about to enter into a partnership with earth and nature, in his profession as a farmer. To enter into

this partnership profitably, he should understand the elements of the soils, the laws of geology and of the vegetable kingdom, in order that he may adapt the one to the other. The laws of animal physiology it is also necessary for him to understand, in order to adapt his stock to his crops. The laws of chemistry, of the composition of soils, of mechanics, the great laws and agencies of nature, all should be known and observed by him, in order successfully to prosecute his calling.

The great improvements in other arts, by the application of science, were alluded to in this connection, and the speaker asked, Is agriculture the only art that is to receive no aid from science? Is she, the oldest daughter of nature, after having fed her sister arts, to be dismissed without any dower? This ought not so to be; the friends of agriculture ought not to allow this so to be. He came to the conclusion that it is the duty of the friends of agriculture, and the duty of the Legislature, to establish an institution independent of all others, from which this knowledge and science can go forth. Establish it with limited means at first, and then let it grow, as the occasion may demand, and its usefulness may be exhibited in its results.

Mr. Proctor said, I concur most heartily in the general views of the resolutions now before this meeting. They say, in one word, that it is the bounden duty of the government, both national and state, to do something for the encouragement and protection of the interests of the farmer. Is not this so? Who are the farmers? Are they not *three fourths* of the whole community? How are they rewarded comparatively? Look at their resources exclusive of the lands they occupy, and will it not be found that the *one fourth*, comprising the commercial and the manufacturing interests, have more than the other *three fourths?* Is there any equity in this? Is not the farmer as useful and reliable as any other class of citizens? On whom has the State ever relied in time of danger, if not on the yeomanry of the country? Those, then, who are her main stay in time of peril, have a right to aid and encouragement in times of prosperity. How can this aid be best ap-

plied? Will it not be best done by educating and fitting them to pursue their employment with intelligence and success.

But *first* and *foremost*, should the State take this matter under its own fostering and guardian care. Let there be established a department of agriculture, analogous to that of education, to whom shall be entrusted the entire supervision and direction of all matters connected with this subject, and soon will it occur to them to mark out the path of improvement. Until such a board is established, no appropriation of money is asked. And when established, the probability is, no expense will be incident thereto, except that of sustaining a competent secretary—all of whose time will be required, in connection with the operations of the board. Surely no valid objection can be made to an appropriation so trifling, compared with the benefits to be gained. Much has been, and may be said in relation to the education of the farmer. Some say this can be done best, by establishing agricultural teachers, in the existing colleges and schools. That teachers of this description may be advantageously introduced, no one will for a moment doubt;—and that it would be highly useful for all, whatever occupation they contemplate, to know something of the science of agriculture, will be readily granted; but that the smattering of information there attained will be adequate to the object in view, no one acquainted with it can for a moment believe. Agriculture is a science—a science most complicated, and difficult to be understood. Its perfect comprehension needs a combination of all the other sciences;—chemistry, geology, botany, and mathematics, are all involved in the study of the science of agriculture. No one can hope to master this science, without becoming an adept, in each and all the others. It is not sufficient to learn them *technically* and *formally*—but he must enter into the philosophy of them, and understand the reasons of the changes brought about.

Mr. Bagg, of the Hampden Society, spoke of the necessity of the appointment of a body of men competent for the work—who should collect and embody the facts which exist now among farmers, and arrange them for the benefit of the community at large. Thrift, he said, was the invariable attendant

upon knowledge, not of scientific knowledge alone, or of practical knowledge alone; but of both combined. It was the duty, therefore, of the Legislature, to encourage this thrift by spreading knowledge among agriculturists.

Mr. Nash, of the Hampshire Society, believed that common sense and experience were of the first necessity, and to these, science would lend the most valuable assistance. He did not believe that practical farmers could become distinguished chemists. But there are principles in the sciences of zoölogy, of animal physiology, &c., which any person may acquire readily, and apply in his every-day experience. Such a knowledge may be obtained in a very short time—if the student be the farmer's son, or the farmer himself is directed to the right point. He would recommend a course of study from which advantages might be received at once. In these requests to the Legislature he would advise the friends of this cause to ask for a small sum to try the experiment, and then, if "their works did not praise them," they would ask for no more. He thought that more than $10 might be saved in each one of the 100,000 barn-yards in this State, by knowledge of a proper management of the manure. Even at one dollar, $100,000 will be saved to the State. The proposed grant of the Legislature would hasten this result, at least, several years, and even if it hastened it but one year, still as much or more would be saved as is asked for by the friends of this cause. He said that by an application of new treatment to a piece of land which he purchased, from eight acres he had increased the crop of grass from three tons to fifteen tons. He hoped the means of extending this knowledge would be granted by the Massachusetts Legislature the present session.

Evening Session.

The meeting was called to order at 7 o'clock. Lieutenant Governor Cushman offered the following resolution, which he sustained in a few interesting and appropriate remarks:—

Resolved, That the resolutions now under consideration be adopted, and that the executive committee be directed to present the same to the Legislature, and to urge such action by that body as may be thought most expedient to carry into practice the *principles* contained in said resolutions.

He said the question most important is, what shall be done? The resolutions have been ably discussed, and the unanimous opinion seems to be that the time has come when agriculture should be exalted and receive from the government that attention and aid which is her right. How shall this be done? By the establishment of a Board of Agriculture as indicated in one of the resolutions. Make agriculture one of the departments of the government.

Mr. Clark, President of the Hampshire, Hampden and Franklin Society, was called upon. He said the word science had got to be a humbug. Some of the weekly agricultural papers had held this word up as a source of terror to the farmers, threatening them with the loss of their farms. Science is truth. Knowledge is science, and knowledge is power. The man who possesses the most knowledge, finds it all useful upon his farm; the more he knows, the more he wants to know. The objections to this subject, he believed, arose from ignorance, and from those who are willing to abide in their ignorance. Farmers ought not thus to be taught to break down their own interests. We want more knowledge to prevent the misapplication of labor—and a school is required to impart this knowledge.

Mr. Daggett, of the Bristol Society, next spoke, and expressed his gratification at Mr. Nash's remarks, but thought they did not go far enough. Mr. Nash, he said, showed that the great majority of farmers could not be thoroughly, scientifically educated. Is not this, Mr. D. asked, an additional argument why a school should be established? Suppose a school be established with say one hundred and twenty scholars, and after having acquired their education, they distributed themselves through the towns in the Commonwealth, where they put theory and knowledge into practice. Their neighbors around them would copy their example—and thus, *by example*, would this knowledge be disseminated from town to town throughout the State. Why, he asked, do farmers take so little interest in the promotion of this knowledge? It is because they do not feel its importance. The great object of this school should be to disseminate knowledge throughout the

Mr. Sprague, President of the Plymouth Society, spoke of the pleasure he had experienced at these meetings. The opinion was expressed by farmers from all parts of the Commonwealth that more agricultural knowledge is needed in our own State; and this unanimity of opinion strengthened very much the hands of those engaged in this movement. He believed it cost more to raise a bushel of grain in New England than in any other country,—owing to the sterility of the soil. This disadvantage is to be overcome,—and he believed it could be done by farmers better understanding the duties of their profession. It was difficult to fix upon a plan for extending this education. Different schemes were proposed. He was willing to begin with a commissioner of high scientific attainments, who, if thought advisable, might be summoned by a board composed of the presidents of the incorporated agricultural societies. This board should offer premiums for experiments calculated to throw light upon practical farming; these experiments to be made under the direction of the commissioners, and the premium to be paid by the State. In this way much valuable information might be obtained.

Dr. Gardner, of Seekonk, hoped the propositions which had been advanced might be carried out. He would like to see an agricultural school, though he believed the better course would be, to disseminate agricultural information by means of the district schools. He would also advocate the establishment of an agricultural professorship in every college in the State. This course, he thought, would reach a far larger number of farmers or farmers' sons, than one exclusively agricultural school.

Rev. Dr. Choules said, the suggestion of the appointment of a commissioner, as made by Mr. Sprague, struck him favorably. Associated with such a commissioner, there might be ten or twelve persons to go through the various school districts in the State, and lecture upon the importance of scientific education to the farmer. Meetings such as these are important, but much might be accomplished by going right among the farmers themselves, in their school districts, and talking familiarly with them upon the subject. This course would make an al-

teration in the feeling of the masses upon the subject, and that is what is wanted. He believed farmers are yet to be taught that they must "magnify their office." A practical farmer was very well, but he cannot make farmers. He cannot educate others to be farmers. An educated man is a powerful man, whether he be a farmer, a mechanic, or an artizan. The man eminent in his profession, whatever it is, stands before a third or second rate man, in another calling. Power is what is wanted by our farmers, and this must be got by knowledge. Dr. Choules alluded to what he observed of farming in his recent tour through Europe. He was astonished at the results he there saw, and which showed the most extended and thorough system, connected with the most rigid economy. He eulogized the exhibition of the British Royal Agricultural Society, and believed $10,000 would be well expended in sending a delegation of our practical farmers to the great exhibition of this society, and then let them come home and tell what they had seen. They would confer a great benefit upon the farmers of Massachusetts.

Mr. Bird, of the executive council, did not agree with the general ideas which had been presented. He did not believe a society like the Royal Society in England would help our farmers, and to show this, proceeded to contrast the condition of the agricultural population there, with ours. He believed we have now all the machinery in operation which is necessary for the diffusion of agricultural knowledge, and that machinery is our system of common schools. He did not believe in colleges of any kind, as the proper place to impart this instruction, and thought the common school system is all that is needed. He also denied that the State had afforded assistance to other interests to the neglect of agriculture.

Professor Fowler replied to Mr. Bird, and showed that other interests had been better cared for than agriculture. He said the interest of the country might be divided into three great branches. First, the agricultural branch, which produces the raw material; second, the manufacturing branch, which works the raw material into shape for the various uses of man; and third, the interest which conveys these products to different

portions of the country or the world, to supply the demand for them. Now, he would ask, is it not true that the country has done much for manufactures, and for commerce, for railroads, &c. These two branches have received much aid and encouragement, but the agricultural branch has not received aid. There was another way in which this might be shown. The last returns show that the number of native Bay State men who are engaged in tilling the soil in Massachusetts is gradually decreasing, and their places are being filled by foreigners from all portions of the old world. Our young men of talent and enterprise are forsaking their farms and going into other callings, where there is more opportunity for exercise of their powers. It is admitted that science is the proper basis for all the arts. It is important that the want of the application of science to agriculture should be felt, and then we should go on to apply it. Common schools would never meet the wants of the farmers for agricultural education. It must be taught in a substantial independent institution. He also objected to the idea, that there is an antagonism between our colleges and common schools.

Mr. Putnam, of Roxbury, said, that the best way to promote agricultural education is to teach farmers' sons to observe closely the laws and agencies of nature in their relation to agriculture. He expressed his satisfaction at the tone of the debate during the meeting, and pledged himself to use all his efforts to promote agricultural education in any position where he might have the opportunity. His own idea was, that there are few who are competent to teach all that is desirable—and yet a great deal of knowledge exists in the community. We want some spot where it can be got together. Some fifty or one hundred men to go round to the various towns as teachers, might disseminate much knowledge. We must have some such place to prepare them. He did not wish a class to be educated to be above work. It would be dangerous to our liberties. The freedom of every country might be measured by the condition of the actual tillers of the soil. Let them be intelligent but hard working. His own views were in favor of a school where farmers' sons can be taught practically in their

callings. These pupils would go forth as school teachers and disseminate this knowledge. He would have a farm managed by one of the best practical farmers he could find, to lead the boys through the field. In the school room they might have lectures from the most thoroughly scientific men who could be found.

Mr. King, editor of the *Journal of Agriculture*, illustrated the application of science to agriculture, and showed the good results which might be expected to follow this application. He closed with an appeal for a suitable school to teach this science.

Remarks were also made by Mr. Nash, of the Hampshire Society, by Mr. Harvey Dodge, of the Worcester Society, and by others, of which, from the lateness of the hour, no report was made.

The resolutions were adopted, and the meeting adjourned.

In pursuance of the resolution adopted by the board, the following memorial, with the resolves on agricultural education, was presented to the Legislature :—

To the Senate and House of Representatives of the Commonwealth of Massachusetts in General Court assembled, the subscribers, officers of the Massachusetts Board of Agriculture, beg leave to submit the following MEMORIAL:

At a late meeting of the board, the accompanying resolutions expressive of the sense of the board on the importance of agriculture, and of the adoption of measures for its improvement, were unanimously passed; and they are now respectfully submitted by the undersigned as a part of their memorial, and in accordance with the following vote:—

"Resolved, *That the resolutions now under consideration be adopted, and that the officers of the Board of Agriculture be directed to present the same to the Legislature, and to urge such action by that body as may be thought most expedient to carry into practice the* principles *contained in said resolutions.*"

The general subject is one which has been often brought to the consideration of the Legislature. For this reason, your memorialists deem it unnecessary, at this time, to engage in its elaborate discussion. They would particularly refer to the report of the commissioners "concerning an agricultural school, and other subjects relative to the advancement of literature in this Commonwealth," which was made to the General Court in the month of January, of the last year, and printed among the documents of the House of Representatives, No. 13. In this document was embodied the report of the Rev. President Hitchcock, of Amherst College, who being in Europe in the sum-

mer of 1850, was requested by the above-named commissioners, of whom he was himself one, to visit as many of the institutions for agricultural education in Europe, as would enable him to understand the system of instruction pursued in those schools, and the mode of conducting and supporting them. The commissioners, in presenting to the Legislature last year the report of President Hitchcock, expressed the opinion, that it embraced an amount of information and research never before communicated to the American people on the subjects referred to. Your memorialists concur in this estimate of the value of President Hitchcock's memoir, and they consider it as superseding the necessity of any elaborate argument, on their part, as to the expediency of extending public aid and patronage to agricultural education.

Without entering upon any general views of the importance of agriculture as the leading pursuit of the people, and of the expediency of adopting some measures hitherto untried in this Commonwealth, to promote its cultivation, your memorialists would respectfully ask the attention of the Legislature to the two practical measures which have been proposed for this end:

The first is the establishment of a Board or Department of Agriculture, as a government institution. Among the resolutions above referred to, and appended to this memorial, is the following:—

"*Resolved*, That, inasmuch as agriculture is the chief occupation of her citizens, the Commonwealth, in the organization of its government, should be provided with a DEPARTMENT OF AGRICULTURE, with offices commensurate with the importance of the duties to be discharged, of the abilities to be required, and the labors to be performed."

This subject engaged the attention of the last Legislature, and a bill was reported from the joint committee of agriculture, providing for the creation of a board of agriculture analogous to the board of education. It was to consist of the governor and lieutenant governor *ex officio*, and of members to be appointed by the agricultural societies. It was to have power to employ a secretary, and to prescribe his duties; and its great object was to pursue a course of measures in reference to the agriculture of the Commonwealth, similar to that which has been pursued with such success by the board of education in reference to that great interest.

Among these measures may be enumerated a visitation of the county agricultural societies, and attendance on their annual exhibitions; the establishment of an annual State exhibition to be held successively in the different counties, with a distribution of premiums under the authority of the board; a systematic agricultural survey of the State once in ten years, with a view to ascertain the progress of husbandry; a full register of agricultural statistics for the Commonwealth; and the dissemination of information valuable to the farmer, together with the formation of a State agricultural library.

It is believed that the organization of an agricultural board, authorized by law, to adopt these, and all other appropriate measures to promote the improvement of agriculture, might at a very moderate expense, render great benefit to this important interest.

The other measure above alluded to is a School for Agricultural Education. As the principal object of President Hitchcock's report is the collection of in-

formation relative to institutions for this purpose in Europe, your memorialists would particularly ask the attention of the General Court to his statements on this subject. It will appear from the facts therein set forth, that these institutions have greatly abounded of late years, and that they are most numerous in those countries which have made the greatest progress in husbandry.

Your memorialists know no reason why such an institution should not be as much wanted, and as beneficial in Massachusetts, as in any country of Europe. We possess a soil of that medium fertility, which makes it necessary to come in aid of nature, by all the resources of art and science. This circumstance gives peculiar importance to the dissemination of that knowledge, which is necessary for the greatest possible enrichment of the soil, the invention and improvement of implements of husbandry, the choice and perfection of breeds of animals, the introduction of superior varieties in the vegetable kingdom, and in a word, the more productive management of a farm in all its departments. For these purposes resort must be had directly or indirectly to almost every department of knowledge; and, your memorialists know of no way by which that knowledge can be attained but by a regular course of instruction.

If it is said that this knowledge can be got out of books by individual and unaided inquiry, this is true to some extent, but no more true of agricultural knowledge than knowledge of any other description. Your memorialists are not aware that it is any more easy to get a thorough knowledge of husbandry by individual exertion and private study, than it is to acquire in that way a competent knowledge of law, medicine or divinity.

Again, your memorialists are sensible that there is a pretty general prejudice against what is called "book farming," and a preference as general for a practical knowledge of the subject. But there is, your memorialists conceive, no opposition between them. If there were, the objection would hold, not so much against institutions for agricultural education, as against the resort to books for private instruction in husbandry. An agricultural school would be provided with an experimental farm where all the processes of husbandry would be performed; with collections where specimens of all the substances useful in farming would be exhibited; and it would be provided with a teacher or teachers practically versed in the art, and able to give instruction not only in the lecture-room, but on the field. The proposition that practical knowledge is more useful to the farmer than book knowledge, certainly furnishes no argument against such an institution. It is one of the most effectual agents for imparting practical knowledge.

Mere book knowledge, if there is any such thing, that is, knowledge derived from meditation, without any experimental acquaintance with facts, must of course be too general to be of value. But knowledge derived from experience does not cease to be valuable because it is recorded in a book. On the contrary, it is in this way that the knowledge of one man becomes available to other men. In institutions for education, however, still a further step is taken. The learner is guided in the choice of books; and the instructions of the dead letter are rendered more impressive by the living voice.

Practical knowledge is got in various ways; from personal observation and experience, from the study of books, and from the instruction of others. In

whatever way it is got, it is better than ignorance. Your memorialists are persuaded that a good foundation in useful science, especially of chemistry, is the best foundation for the enlightened and profitable practice of the art of husbandry.

Your memorialists do not feel it necessary, on this occasion, to dwell at length on the details of such an institution for agricultural education as it may be proper to establish. These details may be properly left to the wisdom and discretion of those who may compose the board of agriculture, should the Legislature think it expedient to establish such a board. The most important point is to lay the foundation, and to leave the development to time and experience. It may only be observed that provision for instruction by lectures, and the use of the best text books on the one hand, and for practice in an experimental farm on the other, seem to be the two great features of an institution for agricultural education.

For further views relative to the foundation and endowment of such an institution, your memorialists respectfully refer to the report of the commissioners above alluded to.

MARSHALL P. WILDER, *President.*

HENRY W. CUSHMAN,
JOHN W. LINCOLN,
Vice Presidents.

EDWARD EVERETT,
JOHN W. PROCTOR,
J. H. W. PAGE,
WM. C. FOWLER.
BENJ. V. FRENCH,
Executive Committee.

Allen W. Dodge, *Cor. Secretary.*
Ed. K. Whitaker, *Rec. Secretary.*

February 4, 1852.

REPORTS OF COMMITTEES.

Ploughing.

Ploughing, as it is first in order of the operations on the farm, so, when viewed in all its bearings, will be found first in importance. It is a science imperfectly understood by farmers. Thousands, who think they know all about it, will laugh at this expression; but still it is the result of long continued observation. It has ever been a leading object of attention by our agricultural societies, and shared a full proportion of the premiums awarded. We should not be surprised to learn that

$20,000 have been awarded in this Commonwealth alone, within the last thirty years, for experiments in ploughing. Certain are we that from fifty to eighty dollars, annually, have been paid by the Essex Society; and if our recollection is right, something like this sum has been paid by each of the other societies.

This being so, it is fair to inquire, what benefits have accrued from these appropriations? It is true, that very great improvements have been made in the structure of the plough. The most indifferent farmer would be ashamed to be found using ploughs, such as were used by his fathers, in the last century. This improvement has resulted, in a good measure, from the competition and diffusion of information consequent upon ploughing matches. The natural result was, to introduce to approbation those ploughs that did the work in the best manner.

It is impossible, in the brief remarks in our power to submit, to notice all those points that demand consideration. We can only mention a few of the most prominent.

1. As to the team proper to be used. In the eastern part of the Commonwealth, as far as our observation has extended, oxen are preferred to horses. Though we have seen very fine ploughing performed by a well trained pair of horses, when the farmer is content with a depth of about six inches, the work can be expeditiously done with such a team, perhaps more so than with any other. But when he would have the earth stirred ten or twelve inches deep, either by the use of a subsoil plough or otherwise, more team will be required, at least two pair of cattle. We have seen land quite well ploughed by the use of one pair of cattle and a horse. Such a team, trained to operate without a driver, we consider the most economical in the power of the farmer to use. Few farmers can get along without a horse, and, as a general remark, no one in New England, who makes farming his business, should presume to carry on the farm without owning a pair of oxen. Unite their power, and his field will be ploughed to best advantage.

2. The practice has been increasing of late years, of turning

the furrow slice as wide as possible,—say from 14 to 18 inches,—and ploughs have been adapted to this end. That plough which would cut the widest furrow and lay it flattest, has been deemed the best. In this way, an acre may be turned in the least time, but, in our opinion, not in the best manner. We prefer to have the furrow slice no wider than is necessary for the complete turning of the sod. What is gained in time is lost in the pulverization. That furrow slice is best, both in width and position, that most facilitates this process. In this respect, we admire the operation of some of the English and Scotch ploughs, and we doubt whether yankee ingenuity has gone ahead in this particular.

In some counties of this Commonwealth we have noticed that their premiums were restricted to teams of one pair of cattle, without a driver; as if it were settled that such teams are adequate to all ploughing purposes. In Worcester especially, we understand it to be "the settled conviction of the trustees, that with one of the improved ploughs, and a single yoke of well matched and well trained oxen of common size, most of the ploughing on a New England farm may be well executed;" that is, by "well executed," as here used, to better advantage, all things considered, than in any other manner. If this be the idea intended to be conveyed, we respectfully say it does not accord with our observation. We should be willing to join the issue on this question, and try it before a jury of twelve practical farmers, drawn from any twelve towns, even of Worcester county, with or without the arguments of counsel.

If one pair of cattle are adequate to all ploughing purposes, it should be known. But that it is not generally believed to be true, is established, we think, by the fact that our farmers do not generally use such a team in the ordinary performance of the work on their farms. They would not be likely to use any more power than they believed to be advantageous. Without doubt, very good work can be done on common field land with such a team; but we think better work can be done with a team of more power, and we should prefer increasing the strength of the team and deepening the movements of the

plough. We have never yet witnessed a team of this description continue to labor, day after day, ploughing the furrow so deep as it ought to be, without encountering too much fatigue.

We have yet to learn of any serious disadvantages accruing from deep ploughing, but are fully persuaded of many advantages. If we do not mistake, the public mind is fast inclining to deep ploughing. Scarcely an agricultural paper is issued, that does not contain an account of some extraordinary crop, almost always preceded by deep ploughing. So often have we witnessed its benefits in the growth of grass, corn, grain, and vegetables, that we should be false to our duty, if, in speaking of ploughing, we did not in this manner urge upon the farmer the importance of deepening his soil. We are not able to name the crop that is not so benefited. Even those vegetables that grow apparently upon the surface, we know are much benefited by stirring the earth occasionally to the depth of ten or twelve inches. Of this we can bear testimony from much observation.

Of late, we have greatly admired the operation of the Michigan subsoil plough, and we believe it is destined to have a highly favorable influence upon our culture. By laying the tough-rooted sod underneath, especially when fully cut and fairly turned flat, as it should be, without doubling over, it is left to pulverize as the roots of the grass decay, and the ammonia thus disengaged comes forward, just at the right time, to invigorate the tender fibres of the growing vegetables. The second strata of the soil, thrown uppermost free of roots, is readily broken and commingled with the compost or other dressing that may be applied. We have heard it said, by men of much practical experience, that by the aid of this plough, in one season, the earth can be as well pulverized and prepared to be lain down to grass, as is ordinarily done by the common plough in two. This, in those sections of the country where it is a primary object with the farmer to keep his land in the best condition for the production of grass, is a decided improvement. Some of the ploughs of this description have not cut the upper furrow slice so fully and turned it so flatly, as it

should be done. This is a defect in their structure that can readily be remedied. It will not often produce any practical inconvenience, where the furrow slice is limited to a width of about ten inches, which is as wide as we prefer to have it turned. We have been thus particular in speaking of this form of the plough, because it has been among us but a short time, and because we would not say anything more in its favor than we are fully persuaded it will bear.

With many cultivators, the side-hill plough has of late been brought into general use, even on level land. It has the advantage of leaving the field in a more finished condition, by avoiding those hollows that are consequent upon the turning of the last furrow of the land ploughed, and by producing a uniformity of appearance at the end. These are slight considerations, but still of sufficient importance to be deemed material, by those who would have work done in the best manner.

Every section of the country has its favorite form of the plough, adopted, often, as much from local or personal considerations, as from any peculiar merits in the structure. For a time, after the introduction of Wood's cast-iron plough, New York took the lead in this class of agricultural implements. But of late, since the ploughs made by Ruggles & Co., Prouty & Co., and Howard and Martin, have been so generally spread abroad, Massachusetts has a ploughing fame, world renowned.

It has seemed to us that a primary object with this board should be, to ascertain what has been learned for certainty in relation to ploughing, and to mark that; and to inquire on what points information is most needed, and the best manner of obtaining it. For this purpose, to point out a mode of offering premiums, with more distinctness and precision, and to require of committees corresponding reports. If uniformity in the offer of premiums, and in the reports of societies, could be introduced, this would afford a ready mode of comparison. A series of experiments for a few years, probably conducted in this manner, would go far towards settling all those points which are deemed most material. We are not unmindful that different soils and different crops, require operations as different as are their qualities. Instance the rocky lands in Worcester, and

the sandy lands of Plymouth, which are to be moved by different machinery. But still, there are many points of common utility, in both these regions.

Much has been said of late of the advantages to accrue from subsoil ploughing. There are few, however, who can speak with confidence from their own experience on this point. The late Mr. Phinney, than whom Massachusetts has had few farmers more observing, was very sanguine as to the benefits to accrue from the use of the subsoil plough. Such, too, is the lesson to be learned from English books on agriculture, in which instruction of great utility is to be found. Without presuming to speak of it with entire confidence arising from our own experience, we think it worthy of the continued attention of the board, and would commend it to the notice of all our societies, until its advantages or disadvantages are more fully tested by actual experiment.

At what season of the year, can grass land be turned over to best advantage? Shall it be done in the spring or in the autumn? A simple inquiry, and one that must present itself to the mind of every one, that has work of the kind to do; but still an inquiry, on which very few are able to give a satisfactory reason for the faith that is in them.

We have ventured these brief suggestions, as specimens of what may be said on the subject of ploughing. We have forborne to expand our remarks, through fear of being tedious. If a more uniform system of offering premiums shall be deemed by the board desirable, we will endeavor to prepare it.

J. W. PROCTOR, *Chairman.*

Milch Cows and Dairy Products.

In the different agricultural societies in this Commonwealth, there exists a great diversity in the modes of testing the merits of milch cows, and of awarding the premiums for butter and cheese. In some of the societies, the premiums offered for these three distinct objects, are made to point to a common result, viz., the ascertaining of the merits of the cow, or herd

of cows, kept by the farmer. The yield of the animal, or animals, in milk, in butter and in cheese, is required, for a given time, as a condition and ground of awarding their premiums, evidently with a view of effecting improvement in the milking properties of the cow, and raising the average standard.

In other societies, this object seems to be wholly, or in part, overlooked. Premiums are offered for the best milch cows, but no rules are prescribed, nor statements required to determine their yield in milk, and rarer still the amount of butter made therefrom. The decision as to the comparative excellence of the cows presented at the shows, seems to be left to the committee's own judgment, formed simply from an inspection of the animals, and such information as may be gained on the spot, from their owners. It is all left to the eye and the ear of the committees; the standard varies with every new committee, and as their reports seldom give the grounds of their awards, the public derive but little or no valuable information. Premiums, too, are offered for the best butter and cheese, of a certain number of pounds in the sample exhibited,—and in some instances, is also required the process of the manufacture of the article—but no certificates are required of the amount manufactured for any specified time. The *quality* of the butter or cheese, is here the only ground, or the principal one, on which the decision is made; to the skill of the dairy-maid is in effect awarded the premium.

There can be no question, as it seems to the committee, that with regard to milch cows, their yield in milk at least, should be required, and for such a length of time, and under such circumstances of feed and treatment, as to test, fully and fairly, their character as milch cows. But the question arises,—and it is an important one,—shall premiums continue to be offered, as heretofore, for single cows, or for a number of cows sufficient to constitute a dairy, a part or all of which shall have been raised by the competitor? Besides our own practice, we find that the Royal Agricultural Society of England, the Highland and Agricultural Society of Scotland, the New York State Agricultural Society, and other of the leading societies in this country, offer their premiums for the best single cows. The Worcester Society, in this State, has recently adopted the plan

of offering premiums for the best dairy of cows; and all who have read the reports on this subject, drawn with so much sound judgment, by the lamented Denny, can there see the reasons for adopting it. The offer of premiums by this society as yet requires that only a certain number of the herd should have been raised by the competitor. It is stated to us by its secretary, William S. Lincoln, that "in a somewhat continued correspondence with Mr. Denny, upon this subject, the expediency of offering a proportionably large premium for the best dairy of cows, *all* of which the competitor should have raised, was discussed, and had he been spared to the society, such a proposal would have been offered for its consideration."

Mr. Lincoln adds, that "he thinks himself more highly of such a proposal than of any other which could be offered, viewing it merely with reference to the effect it would have upon the improvement of our stock." The advantages of the plan proposed, are, he further observes, "that you compare the actual yield of *herds* of cows for the season, instead of single ones for a limited period; that you get facts enabling you to determine the relative profit of cheese or butter making, or selling of milk, and that the farmer in towns at a long distance from the place of the cattle show, with his forty cows, can compete for the premiums with the farmer within a mile of the show, with the only difference that he must drive one cow the long distance, instead of a mile, to be examined." From this it would appear, that one cow at least, would be presented at the show, to add interest to it, and as a specimen of the herd, whose actual produce in butter, cheese, or milk, is to be certified to the committee. To this mode of proceeding, as a substitute for the offering of premiums for single cows, there seem to us to be serious objections. So far, however, as it may tend to encourage the breeding or selection of a large number of good dairy cows, we hope it may have a fair trial; though these advantages, as it appears to us, may be more easily attained, without driving any of the herd to the show, as we will endeavor to make appear in a subsequent part of this report, when treating of the products of the dairy.

We can see objections to offering premiums for single cows, more easily than we can perceive how to obviate them. It is

said that our premiums are thus bestowed on creatures of accident or feeding. Still, extraordinary cows are rare among us, and yet it is desirable that they be seen at our cattle shows, and that their good points and marks of distinction may be witnessed by all who are interested in these animals. And as the owner of a good cow is apt to believe her the best that can be produced, a large number of such cows is generally found on the show ground, thus adding to its interest, and even by the display exciting a laudable emulation. That by this course encouragement is offered for the breeding of improved stock—for the improvement which would follow from careful selection and raising of the best calves, whether from native or foreign breeds, we will not undertake to determine. To some extent this may be the effect, but we have serious doubts if it tend directly to produce this result. Where the breeding of animals is the business of the farmer, he will be stimulated to breed only the best, by the high prices obtained for them. Let the demand for good cows be general, let there be quick sales and large prices, and the self-interest of the breeder is excited to endeavor to breed and raise none but the best. Whatever, therefore, goes to enhance the price and increase the demand for good cows, tends strongly, as we conceive, to stimulate the breeding of them. The exhibition of such cows, in competition with one another, at a cattle show, adds largely to their value, both in the mind of the owner and in that of the public; —and this much, at least, can be safely said in favor of offering premiums for single cows.

But that the average standard of the cows in Massachusetts, is altogether too low, both for her interest and reputation, and that greater and more systematic efforts should be made to raise it, your committee cannot entertain a doubt. Some intelligent farmers have expressed the opinion, that by proper care in the selection of cows, the average quantity of milk might be increased, equal to two quarts per day, for nine months in each year; and that by a like regard to the quality, the value might be enhanced nearly as much more;—say, that by this attention to selection, an improvement may be made equal to an increase of two quarts per day, for 274 days in each year. And this

must be considered a low estimate, if some of the farmers in Berkshire have, as the board have recently been informed, raised the annual average of the cheese made by them, from 200 pounds to 500 pounds per cow, by careful regard to the selection and the care of their stock. Apply this to the county of Worcester, in which there are, as appears from the returns of the several towns, as made to the last valuation committee, 35,591 cows of three years old and upwards, and at three cents per quart, (it sells for four and five cents,) and we have the amount of $585,116 04. But to avoid any imputation of extravagance in this estimate, reduce the two quarts to one quart, and we have then the large sum of $292,558 02. No deduction has been made from the number of cows above-mentioned, for barren three-years-old heifers, or for older cows which were dry to be fatted, as it is believed there was a much greater number of two-years-old heifers in milk, than would make good any deficiency in the milch cows.

A great proportion of our cows are said to be of the native breed, that is, of a mixed breed. All are called native, of which the proportion of blood of recent importation, is not known. It is very much to be regretted, that by judicious breeding, distinctive breeds have not been formed, which should be known by their excellence. In this case, the offering of premiums for the best single cows, would afford more encouragement to the breeding from such cows, as they would be more likely, than our cows now are, to transmit their good qualities. As yet, however, but little attention has been paid to the improvement of our stock, by the selection of choice animals, both male and female, and raising a stock from them. With too many of our farmers, the butcher has been allowed to select the best calves for slaughter, and the refuse has been raised. With these, the character of the bull is of little consideration, and an ordinary animal is often used, because his services are to be had at a reduced price. If, as is believed by many, the bull transmits to his female progeny his own characteristics, it is of the highest importance that no bull should be raised, except from a milking breed. If the selection here recommended, could be had, and the calves from those parents

were not allowed to be killed, except from some defect in their appearance, we might, in a few years, expect that the character of our milch stock would be greatly improved.

Among our, so called, native cows are many very excellent milkers, and we doubt not that by a proper selection and judicious breeding, a valuable milking breed can be obtained. The good properties of the cows, at the commencement, being accidental, it would be some years before the breed could be so far improved, that much reliance could be had upon the future character of the calves. What has been done by that judicious breeder, Col. Samuel Jaques, in getting up the Cream Pot breed, can be done by others for the same object. The appearance of many of our *native* cattle, indicates, with much certainty, from what foreign blood they are descended. Many of them show strong marks of the Durham or Short Horn blood; others of the Ayrshire, of the Hereford, and of the Devon family. Of these different breeds, as well as the Alderney, of which the Massachusetts Society for the promotion of agriculture have lately made an importation with the desire to improve the milking character of the neat stock of the Commonwealth, we will not offer any opinion, as their peculiar traits are well understood. We would, however, recommend to every farmer to gain such a knowledge of the different breeds, as to be able at a glance to distinguish them; and more than this, to observe carefully the marks of a good cow—whatever these marks may be—so as to make a good selection when he is obliged, in purchasing, to depend upon his own judgment.

In offering premiums for single milch cows, if all our societies would require a return of their yield in milk and butter, for the first ten days in June, and the first ten days in September, with the age and breed of the animals, the time of dropping their last calf, and their feed during the season, a rule sufficiently general would be established, to enable us to institute something like an approximate comparison between the best cows in the Commonwealth. At present, however, we are not sufficiently advised to propose, with confidence, any uniform conditions in such premiums, for the adoption of our societies.

In reference to butter and cheese, where premiums are specially offered for these products, it appears to your committee that while the *quality* of the specimens presented for competition, should be an element, and an important element, in making up the award; and while the furnishing of a statement of the process of manufacture, should be required as a condition of the award; there should also be given in the statement, the *quantity* of these articles made by the competitors during the season, or some specified time. We would go even further than this, if it should be found practicable. We would require as a condition of receiving a premium, that a certain standard in quantity, during a given time, should have been reached. In awarding premiums for grain crops, many of our societies prescribe the number of bushels per acre that must be raised, to entitle any one to be a competitor. This would seem to be a wise rule. Why not apply a similar rule in respect to competitors for the premiums for butter and cheese? Something of this kind has already been attempted. In the premium list of the Essex Society for 1823, may be found the following offer:

"For the greatest quantity of good butter, in proportion to the number of cows producing it, (not fewer than four,) made on any farm, from the 20th of May to the 20th of November, 26 weeks, and the quantity of butter averaging not less than seven pounds per week for each cow, $20; for the second greatest, $15; for the third greatest, $10. The kinds of food and the management of the butter, to be detailed." Then follow these remarks, written undoubtedly by Timothy Pickering, then president of the society:

"The object of agricultural institutions is improvement; and in Essex none seems to be more wanted than in milch cows. If the society were to continue their premiums during any length of time, *merely* for the greatest quantity of butter, they would not enforce any improvement in the quality of those animals. Seven pounds of butter a week, for each cow, is less than half of what the Oakes cow, of Danvers, produced in the same time. The seven pounds a week, therefore, are very attainable by every farmer who will improve his breed of cows, and feed them to the full with juicy and highly nourishing

food. The committee trust they do not entertain a groundless hope that the premiums here offered will have claimants; and that in some future years, the trustees will be justified in confining these premiums to cows yielding 10, 12, and 14 lbs. of butter a week, for 26 weeks in the year."

How mortifying the reflection, that after the lapse of nearly thirty years, since this hope was expressed, it has failed to be realized; and for the reason, that the milch cows—not in Essex only, but throughout the State—have not been improved, agreeably with such sanguine expectations. We may well stop to inquire, whether, by the agricultural community, sufficient attention has been paid to the quality, as well as the quantity of milk given by the cows? It is feared that too many of our farmers—and dairy farmers, too—have no other test of a good cow, than the quantity of milk, as it measures in the pail, without an inquiry whether that milk is of much more value than the same quantity of water, which he could pump from his well. This is not a matter of mere conjecture. We are frequently informed of the disappointment of the owner in the estimate he had formed of the value of one of his favorite cows; and it is believed that a careful examination would discover the comparative worthlessness for butter of many cows, now held in high estimation.

A few years since, one of the committee had a farm, which was leased on shares, appropriated to dairy purposes, on which 25 cows were kept, which were owned in common by himself and the tenant. Accidental circumstances induced a comparison between a cow which was considered the most valuable in the herd, because she yielded a large supply of milk, and a cow which had been purchased at a small price. Repeated trials were had by the lactometer, and the result was that the milk of the cow which had been held in high estimation, afforded cream of only 4-10 of an inch in thickness; and the same quantity of the milk of the low-priced cow gave cream of the thickness of 1 and 4-10 of an inch, and of a much yellower color than that of the other. The cheap cow was in reality the most valuable animal. The cow which had been so highly esteemed, had been in the dairy two years or more,

without a suspicion, until this trial, that she had not paid her keeping.

Dr. Anderson, the distinguished Scotch writer on the dairy, mentions an instance of one cow, from whose milk no butter could be made. She was purchased of a farmer who kept a large dairy, by a person who had no other cow, and thus the discovery was made. Thrown into the general mass, her milk had been useless, and her keeping a dead loss to the farmer. Hence the Doctor judiciously recommends the setting, in a separate pan, the milk of every cow, to ascertain its quality, that such as give meagre milk may be fattened and sent to the slaughter-house. And we would urge it upon every farmer to test all his cows, both as regards the quality and quantity of milk they severally yield, confident as we are that by this simple process, and disposing of such cows as he thus finds cannot be profitably kept, the profits of his dairy will be increased, and the character of his cows be transmitted with more certainty to their offspring.

By adopting a mode of offering premiums for butter and for cheese, similar to the one formerly made by the Essex Society, there would be the strongest inducement,—so far as agricultural societies are concerned,—held out to the farmer to keep only the best of milch stock. A condition might also be inserted, if it should be deemed advisable, that the cows, whose butter was entered for premium, should be of the competitor's own raising; but, as in some of our counties the breeding of neat stock is practised only to a limited extent, a uniform condition of this kind, for all the societies, would not seem to be advisable. Let the quantity of butter and of cheese for the dairying part of the year, be required to be stated, as well as the process of making, as conditions precedent to the award, and let the standard be so high as to encourage only the keeping of the best herds of cows, and we believe that our societies will be aiding, most effectively, to produce an improvement in the dairy stock of the State.

In conclusion, the committee, being instructed to ascertain and report whether any and what measures for milk, are prescribed by statute, would say, that by the act of the Legisla-

ture of 1847, the wine gallon, wine quart, wine pint, and wine half-pint, are enumerated as the standard liquid measures to be used in this Commonwealth, and that any person who shall presume to sell by any other liquid measures than these, and which shall be sealed, shall forfeit and pay a sum not exceeding twenty dollars for every such offence, one half to the use of the town where the offence is committed, and one half to the complainant.

The statutes of the Commonwealth recognizing no liquid measures but wine measures, it is evident that no others can be legally used in the sale of milk. And we recommend, therefore, that sealed wine measures be invariably required to be used by the competitors for premiums, who make returns of the produce of their cows in milk. In this way will our agricultural societies exert an important influence in introducing uniformity in the admeasurement of milk, and in aiding to carry into effect the laws of the Commonwealth.

For the Committee, ALLEN W. DODGE.

Neat Cattle.

Your committee have been instructed to report upon all kinds of live stock, but as it is apparent to them, that they cannot even approach towards the performance of their duty, where the field is so broad, they have judged it best to confine their remarks to a single race, that of neat cattle. When we consider the various breeds and vast number and value of cattle in our country, it is apparent that much more might be said upon this subject alone, than can be embraced in this report.

By the census of 1840, the number of cattle in the country, was about 15 millions. At this period, their number must be 18 to 20 millions. Let us consider the vast augmentation of agricultural wealth which might be produced by an average improvement of one dollar in each animal,—and this and even much more may, in the judgment of your committee, be done, —a small portion only of the wealth thus gained, would suffice to extend that agricultural education to the sons of the farmer, which they need and require, and thus exhibit with enlight-

ened farmers, improved stock, improvements in agriculture, and, as its natural consequence, a great augmentation of the value of our farms.

The question obviously suggested is, how shall this improvement in cattle be attained? We answer, by selecting judiciously, and with great care, your breeding animals. It will not suffice that you have a good cow for this purpose, the bull must also possess the requisite qualities; for it is to him, in the opinion of many of the most enlightened breeders in England, that we are to look, more than to the dam, for an improvement in the progeny. In breeding and rearing cattle, three great objects are sought to be attained—cows for their milk, oxen for the yoke, and when they cease to be valuable for these purposes, to be devoted to the shambles.

The remark is common, "why not select the best of our native cattle to effect these purposes?" We reply, that the sound principle that "like begets like," cannot be relied upon in their produce. They greatly vary in their symmetry and other characteristics; their blood has not become inherent in them, by a long course of breeding in a direct line from select animals, and hence little reliance can be placed upon the progeny thus bred. When we have races of cattle of greatly improved breeds, already within the reach of all, and some of them bred in a direct line for more than seventy years, why is it needful to discuss this subject? Is there an intelligent breeder of cattle who will affirm that a comparison can be instituted, except to their disadvantage, between the native cattle of the last century, (and there is, unfortunately, too much of their blood still remaining,) and the beautiful and highly bred Short-horns and Devons of the present day?

The topics which we here discuss, and our mode of treating them, are not new; we claim for them not originality, yet they cannot too often, nor with too much force, be impressed upon the breeders of cattle. In a long course of breeding, in a direct line, no intelligent breeder will resist the conclusion, whether it be in cattle, horses, sheep, or swine, that the characteristics of the sires and dams will be imparted to their progeny. Breeding from close affinities should be avoided, for the result

of it must be impaired constitutions. *All* of the cows of any given breed cannot be expected to excel as milkers, for their ancestry were reared to too much extent in England, as they now are in the Western States, with more reference to their flesh for the shambles, than for their milking properties. Hence it is obvious, from the principles here laid down, that to produce a superior milking herd, we must select for breeders, such animals as have descended from tribes which have this valuable characteristic rendered inherent in them by breeding. When cows are deficient in any one point, (and few are entirely perfect,) care should be taken to breed them to bulls which are full in the points thus defective in the female, so that in the produce the defect may be corrected. The great average increased weight of bullocks, slaughtered in the principal markets of England and this country, since the beginning of the present century, is doubtless to be mainly attributed to the introduction of the short-horn blood. Yet this is not the only advantage gained by this improvement, for in the Smithfield, as well as our own markets, up to the close of the past century, animals were judged of almost alone by their bulk; whilst since that period, science applied to breeding has so changed the structure of animals, that the offal and less valuable parts of the beast are greatly reduced, and in the same proportion the most valuable parts of the carcass are augmented.

The late Thomas Bates, of Kirkleavington, England, one of the most eminent breeders of that country, said, in a publication a few years since, "Nearly fifty years ago, I adopted the plan of weighing my cattle and their food, so as to ascertain the improvement in proportion to the food consumed, and from a minute and close attention to this subject, I obtained that knowledge of cattle which enabled me to judge of their real merits by their external character, and which I have never known to fail, in my experience as a breeder, for about forty years. From that knowledge, thus acquired, I selected the Dutchess tribe of short-horns, as superior to all other cattle, not only as small consumers of food, but as great growers, and quick grazers, with the first quality of beef, and also giving a great quantity of very rich milk."

The Scioto (Ohio) Gazette says, that "from 25 to 30,000 head of their best beef cattle are annually driven to the eastern markets, from the Scioto valley, south of the national road; that the short-horn stock has become widely disseminated throughout this state in all the grazing and feeding regions. That the greatest gain is to be found in the increased average weight of the fat cattle driven from this neighborhood, which is not less than 100 pounds per head, above that which prevailed twenty years ago." Now assume the average price for such beef in the markets to which these cattle were sent, to have been $6 per 100 pounds, the value thus gained is from $150 to $180,000, to this small portion of the state of Ohio alone.

The prevailing breed of cows employed in and near London, to supply that great metropolis with milk, is the short-horn. Yet it is not alone that they yield more milk than other races, that preference is given to them, but because the carcass is more valuable, after they have ceased to be profitable as milkers. It is simply because they yield more value in milk and flesh, in proportion to the food consumed, than other breeds, that they are adopted. This race of cows must have been used for this purpose in London, to at least some extent, for half a century; and it is difficult to believe that great numbers of individuals, after so long a period, will arrive at a conclusion which conflicts with their own interests.

Much of the soil of New England being thin and sterile, we would not advise that the short-horns be adopted in such localities, nor indeed in any, except they be well cared for; for if animals must have short feed, a small race is more desirable to be so used than a large one. Hence, for animals so to be kept, we do not hesitate to recommend the Devons. We believe them, as milkers, to equal most other races, whilst their uniformity of color, size, and sprightliness, render them for the yoke, equal to any other race. Yet, on the other hand, where pasturage is luxuriant, and in all cases where animals can be well kept, in summer as well as winter, we cannot hesitate to advise that the race of short-horns be adopted.

PAOLI LATHROP, *Chairman.*

Farms and Improvement of Lands.

The committee, instead of indulging in general remarks, to which the subject strongly invites, confine themselves to a few observations on two or three particulars respecting the condition of our farms.

In looking at the farms in Massachusetts, that which would most strike a stranger is, the great irregularity not only in their exterior forms, but in their interior subdivisions. Look at a map of almost any of our older farms, and you will be struck with this fact. Every variety of angle that delighted the genius of Euclid, could be matched by the subdividing lines of our farms. Could we imagine some intelligent being, unacquainted with the inventive genius of a Yankee farmer, looking, for the first time, at the map of a New England farm, he might well suppose that it had been drawn for the purpose of solving problems in geometry. Our fields present to the eye all the different forms of obtuse and acute angles, and specimens even of the serpentine and the curvilinear, a mighty maze, and all without a plan!

The fields of our farms are of all sizes, as well as of all shapes, from the small enclosure of a quarter of an acre, to the rambling pasture of twenty acres.

The unseemly and inconvenient shape of our farms, is owing, in great part, to the manner in which our lands were originally laid out in the settlement of the country. Companies were formed who, with the consent of government, purchased townships, or other large tracts of unoccupied land, and made divisions, from time to time, of small quantities of the common lands among the proprietors, leaving each one to select and locate his own lot. Of course, an individual having a right to lay out in the undivided lands a certain quantity at a time, say ten acres more or less, would cause it to be surveyed in such shape as to include within its boundaries the greatest value, without regard to any general arrangement, or the form which his tract would present on the map. We feel the effects of this unfortunate system, (or, with more truth, this total want of system) in the division of the public lands, at the settlement of the country. Many, if not the most of these lots so laid out,

have descended to us unchanged in their original forms, and will continue to embarrass for generations to come.

These ill-shaped subdivisions are owing, in some degree, to the natural diversity in the surface of the ground, and differences in the quality of the soil. Waste lands, (so called) were left out in common; the poorer soils were kept for pastures, while the richer portions, in the shape and extent in which they happened to exist, were inclosed for cultivation. Much improvement in this respect, may be made in the interior divisions of our farms, but their outlines will probably forever remain more or less irregular. Compare our farms with those at the west. How different is our plan of a farm from that perfect and uniform system, under which the public lands are surveyed and divided into squares and parallelograms. These divisions, we understand, are generally preserved among the farmers at the west.

The increased unnecessary cost of fencing in this State, on this account, is an item in the aggregate of vast amount, and is well worthy of our consideration. By having our farms properly and skilfully laid out, we could save seventy-five rods in every hundred of fencing. Any one will be convinced of this, who will barely cast his eye upon a map of one of our farms, with all its irregular and unnecessary subdivisions. The additional labor of cultivating a farm, thus irregularly laid out, is another and an important item in the expense of New England farming. The difference between cultivating a field of a large size in the form of a square or parallelogram, or the same quantity in the form of a triangle, or divided into four or five lots of irregular shape, may be plainly discovered by observing the difference in the temper of the driver, the team, and the ploughman, while working in the latter and in the former. If it takes a whole day to plough a piece containing one acre, twenty rods by eight rods, lengthwise, it will take more than one day to plough two half acres the same way, ten by eight rods. If a team, in ploughing the former piece, turns about 132 times, in ploughing the latter it must turn about twice that number, 264 times. We have been informed by farm laborers, who have worked in the new states, that they have ploughed

furrows a mile in length in one field. In such a case, but little time is lost in stopping the team and turning about at the end of the field.

These facts may seem to some trifling, but they are of practical importance. We need, therefore, another branch of science, which might be called the "geometry of farming." The mode of laying out our farms into lots of the form requiring the least length of fence and the most convenient and economical for cultivation, is deserving of attention, and seems to have been almost entirely overlooked in New England. A little examination will satisfy any one, that the manner in which our farms are laid out and subdivided, is inconvenient, expensive, and the cause of much loss of time and labor in their cultivation.

There is one method of improving our farms, and rendering them more valuable and profitable, which should receive more attention at this age of the country, that of the appropriation of waste lands to the growth of wood and timber. This remark is intended to apply particularly to the southern, eastern, and central portions of the State. In these parts of the State, almost every farmer has large quantities of waste, or unimproved lands, unfit for pasturage or cultivation, from which he derives but little, if any profit. Such lands may generally be devoted to the growth of wood and timber. It is a good investment. The growth of a wood lot, in these parts of the State, will, as a general rule, yield the farmer more than six per cent. interest, and that too without subjecting him to a charge of usury. There are many fields, which have been almost entirely exhausted of all fertility by constant cropping without manuring, and have been abandoned for years to hopeless sterility, trodden only by the rambling feet of the cattle that fed upon their scanty herbage. These fields, if cattle are prevented from feeding them, will usually, though gradually, become covered with a growth of some species of wood, to which the condition of the soil is adapted. In the southern part of Massachusetts, the first growth on such lands will consist principally of white or black pine and the white birch. This process is now going on in a field of the above descrip-

tion, which your committee have carefully observed for several years past. Cleared lands may be converted into woodlands, by the "let alone" process, or what the politicians call a "masterly inactivity;" in other words, by the unaided operations of nature; or it may be done by planting or sowing the seed, or by transplanting.

The second growth will consist of some other species of our native forest trees, and is an example of that succession of growths, or in other words, of that rotation of crops established by the laws of nature. This is the method which nature adopts, to restore fertility to exhausted lands, and is an instance of that wonderful economy of the Creator, which keeps up a continual succession of vegetation on the surface of the earth. The growth and decay of one species, but affords the means for another and different species. Hence, we have but to discover and apply the laws of nature to the cultivation of the earth by the hands of man. This is the business of the science of agriculture. This shows also the restorative powers of nature, evincing her ceaseless efforts to renovate the exhausted soil, and to preserve it in a condition capable of production.

Contrary to the practice of man, nature is constantly struggling to renovate the soil. Decay is not stamped on the soil, as it is on the works of human hands, but so far as our observation extends, eternal activity and reproduction are its characteristics. When left entirely to itself, we see the efforts of nature to restore a soil exhausted and impoverished by the avarice and imprudence of man to its original and natural fertility. By this admirable provision of Providence, the efforts of nature are continually aiding man in preserving or restoring the productiveness of the earth. Where fertility is not totally abstracted from the soil, we see a constant tendency to a growth of some form of vegetation. Throw up earth from a depth of thirty feet beneath the surface, and in a brief season it will be clothed with vegetation.

The woodlands in the southern and eastern counties of the State, are insufficient to supply the present population with fuel. This species of land has been gradually diminishing till a recent period, when farmers became convinced they were

attempting to improve too much land. Timber of much size, as is well known, has become very scarce. In this part of the State, woodland is, on an average, of more value than cleared, or improved land; and by appropriating a larger quantity of our lands to the growth of wood, we should add to the value of our farms. We cannot only do this, but we can devote such parts of our farms as are too rocky, rough and uneven for the plough or the scythe, to this purpose, or those which have become poor and impoverished, and reserve the richest and best for cultivation.

The labor of this conversion is not great. Philosophers may dispute, as they long have done, about the natural state of man, but no intelligent observer can doubt that the growing of wood is the natural state of the earth. Should this whole continent be abandoned by civilized man, and left to the uncontrolled but solitary operations of nature, we should again see its soil return to its original fertility; the waste places would be covered with vegetation; the barren would become productive, and another Columbus, in some distant age, would behold its hills and vallies and plains, covered with a dense forest and its surface rich with the accumulations of ages; tenanted by the wild beast, and perhaps trodden here and there, as of old, by some other race of men, who had wandered from the abodes of civilized life and become lost in these boundless solitudes of the western world.

Thus we find the whole tendency of natural causes is, through the growth and decay of vegetation and perpetual reproduction, to renovate the earth, and to coöperate with man in adorning its surface with beauty and abundance. We have but to take hints from these suggestions of nature, to learn the course we should pursue in cultivating the soil.

The only other particular to which your committee would direct the attention of the board, is the fact, that our agricultural science is mostly of foreign origin, and the effect which that has in retarding the progress of our own agriculture. We need an agricultural science and art adapted to our own country. This country was settled, as we all know, principally by emigrant husbandmen from England. They brought with

them the agricultural implements used in their native land, and adopted here the modes of cultivation to which they had been bred. These implements and practices, with some modifications, have descended to us. We are, to a great extent, cultivating our lands on English models. Our agricultural works are mostly of English origin.

We ought to have an American system of agriculture. We are practising on principles and theories, originating in a country, in some respects widely different in climate, soil, products, and the social condition of its laboring population. England has a moist, humid climate; fog and rain are daily features of its scenery—it has been called the "fog-wrapped island of Great Britain." We, on the contrary, are subject to severe and long-continued droughts. There, the watchful farmer is troubled with cloudy and dull weather, with but little clear, steady sunshine. Here, he is parched by scorching suns, oftener, than is supposed, destructive to our fruits and vegetation. There, he has to guard against an excess of moisture; here, he has to guard against the want of it. There, land is dear and labor cheap; here, labor is dear and land is cheap.

We need a system so modified as to be adapted to our situation. Practices in the cultivation of the earth are continued here, originating in physical causes, which do not exist here. The practice of hilling and ridging, so common in English husbandry, and so useful in that climate, are pertinaciously continued by New England farmers, as if it were applicable here, when, in fact, the reverse should prevail. It is an old and a sound maxim in the law, that when the reason on which a rule is founded, ceases, the rule itself should cease. So, in agriculture, when the reason, on which a practice was founded, ceases to exist, the practice itself should cease. Nearly all our ideas of farming, have been drawn from English authors. In order to a successful cultivation of our soil, and the permanent improvement of our farms, we must create an American system of agriculture. We must see with our own eyes, and decide with our own judgment.

We must adapt our system of culture to the nature of our soil, and the climate in which we live to the products we

raise, and the social condition of the laborer of the country. It is not true economy for us, in a comparatively new country, to indulge in the luxuries of English farming; to follow the example of some wealthy duke, in a country where capital is abundant, and labor superabundant. We would not be understood as attempting to depreciate English husbandry, for we have high respect for the science and skill of English agriculturists; but merely to show that it is not, in many respects, adapted to our country; and that, while studying the works of British writers, and attempting to reduce to practice here a foreign system of agriculture, we need the power of a wise and careful discrimination.

For the Committee, JOHN DAGGETT.

Cultivation and Measurement of Crops.

The committee, understanding that the duties of the committee were not, as their designation would in part imply, to consider the best mode of cultivation of crops, but to provide uniform rules for the offering and awarding of premiums in relation to crops, have attended to the duty assigned them as they understood it. From all the inquiry the committee have been able to make, they find that there is a great diversity in the practice of the several agricultural societies, as to the information to be afforded by a claimant to entitle himself to a premium, whether for a grain or root crop; and in most cases allowing the applicant to ascertain the quantity in his own manner, having no evidence of his correctness save his own declaration.

The committee think that the applicants should state the general character of the land in the spring of the previous year, its condition at that time, with a detailed statement of the manner of cultivation, quantity and quality of manure, and the products of the previous year. The condition of the land at the commencement of the present year; and a detailed statement of the quantity and quality of manure used the present year, when and how applied; the mode of cultivation preparatory to sowing or planting; the quantity and quality of seed used; time and manner of sowing, weeding, cultivating and

harvesting the crop; the amount of produce, ascertained by actual measurement or weight, after the whole is harvested; the expense of the seed, manure, labor and cultivation; and the value of the product. That the land be measured and staked out by a practical surveyor, by chain and compass, to be in one piece, either in a square or oblong square form, if the field will admit of it; and in all cases where the crop is grown in rows or in hills, the measure shall be taken from the centre between the rows to the centre between rows; the measure to be as near the quantity wanted as can conveniently be had; the measure to be carefully taken by the surveyor, and to be accurately described in his certificate, which should be sworn to. In addition to the affidavit and certificate of the surveyor as to the land, each applicant should file his own certificate (if the harvesting has been done by himself in person,) under oath, of the amount of products grown on the land measured and staked by the surveyor; with the affidavit of a disinterested person who assisted in the harvesting, of the amount of the crop grown on the land. If the harvesting is done by others than the applicant, the affidavits of two persons who performed the harvesting, should be required.

In relation to the manner of ascertaining the quantity of the several crops grown, with such accuracy as will be satisfactory to the agricultural community, much difficulty exists. The society which has adopted apparently the most definite rule for determining the amount of the crops, is the Plymouth Society. They have provided that "the supervisor will visit the fields once or more, while the crops are growing; and at the time of harvest, he will select one square rod regarded as an average of the field, see it harvested and weighed, by which the whole shall be estimated—85 lbs. of corn in the ear computed a bushel." This, as regards corn, might be considered as a near approximation to the truth, if corn of different fields was equally dry; but as that is known not to be the case, it appears to be desirable that the examination should proceed further. In consequence of the obligation to file the doings of the societies, in the office of the secretary of the Commonwealth, on or before the 10th day of January, the statements of the competitors for

premiums should be made, and in the hands of the appropriate committee, before the first day of December previous, to allow their transactions to be seasonably printed. At that time, corn is not in a merchantable condition. It is usually harvested the latter part of October, or during the first days of November, and at that season there will be a great difference between different fields, as to the dryness of the corn and the cob. Much has been occasioned by the location and the soil on which it was grown. Corn will ripen much earlier on a warm sandy soil, than on a heavy clayey loam, and therefore there will be much more shrinkage on corn from the one field, than on that from the other. It is suggested that the supervisor, or committee of examination, should take away some of the corn which they had weighed, (say, one bushel,) which should at the time be both accurately weighed and measured, from each field, subject it to artificial heat until properly dried, and correct their former estimate by the result.

The rule of the Plymouth Society, as applied to root crops, may not operate more satisfactorily than in relation to corn. It will be extremely difficult to select a square rod, which shall prove a fair average of the field, merely by inspection, particularly of carrots. The appearance of the tops does not indicate, with any correctness, whether the roots are long or short, and on this fact the amount of the product must greatly depend. It is believed that root crops can be better estimated by weight, than by measure.

The Legislature having determined that Indian corn, wheat, rye, buckwheat, barley, oats, and potatoes, shall be sold by weight, and having prescribed the number of pounds which shall be taken for a bushel, there seems to be a strong propriety for assuming the same principle in ascertaining the amount of those crops, and extending it to other crops for which there is no legal provision. The law says, "in order to ascertain the mean or true weight, each vender" [applicant] "shall weigh ten measures at least, in every hundred bushels."

A bushel of	Indian Corn	shall be deemed to be			-	56 lbs.
"	" Rye	"	"	"	-	56 "
"	" Barley	"	"	"	-	46 "

A bushel of	Buckwheat	shall be	deemed	to be	-	46 lbs.
"	" Oats	"	"	"	-	30 "
"	" Wheat	"	"	"	-	60 "
"	" Potatoes	"	"	"	-	60 "
"	" Carrots	"	"	"	-	55 "
"	" Sugar beets	"	"	"	-	60 "
"	" Mangel wurtzel	"	"	"	-	60 "
"	" Ruta baga	"	"	"	-	60 "
"	" Parsnips	"	"	"	-	45 "
"	" Common or English turnips			"	-	50 "
"	" White beans shall be deemed			"	-	60 "
"	" Peas	"	"	"	-	60 "
"	" Onions	"	"	"	-	50 "

The root crops to be free from dirt, without tops, and in a merchantable condition at the time of the measurement.

Cranberries do not seem, so far as the committee can learn, to have an established weight for a bushel. Meslins, not being uniformly composed of the same mixture of grains, must be measured by the bushel; the kinds of grain should be stated, as also the number of the bushels, and the weight per bushel, to aid the committee in forming an opinion of the value. As to broom corn, the amount of seed and the weight of brush per acre, should be stated, when prepared for market, and the method of preparing it.

In all cases where measure is required, it must be had in a sealed half-bushel, of the standard of Massachusetts.

It has been stated, that the several committees are usually required to discharge their duties with so much haste, particularly on the day of the society's show, that they have not opportunity to examine the certificates required by their society, to entitle the claimant to a premium, with sufficient care to see that all the requisitions of the society have been fully complied with. It is suggested, that each society should appoint a committee, whose duty it shall be to examine all certificates required by their rules, see that they are correctly made out, and that all the information wanted has been fully given, and if found satisfactory, certify their approval thereon to the appropriate committee, who shall not be at liberty to award a premium to any person whose certificate has been disapproved.

The form of the affidavits may be as follows:—

Affidavit of the Surveyor.

ss. 1852. being duly sworn, says that he is a practical surveyor; that he surveyed with a chain and compass, in the manner prescribed by the rules of the society, the land upon which raised a crop of the past season, and at the same time put down stakes at the angles thereof, and the quantity of the land so measured and staked out, is and no more.

Surveyor.

Sworn before me, this day of 1852.

Justice of the Peace.

Affidavit of the Applicant.

ss. 1852. being duly sworn, says that he has raised a crop of the past season, upon the land measured and staked out, by surveyor, and that the quantity of was bushels, measured and computed in the manner prescribed by the Agricultural Society; and that he was assisted in harvesting and ascertaining the quantity of said crop, by ; and that the statement annexed, subscribed by this deponent, as to the manner of cultivation, expenses, &c., is in all respects true, to the best of his knowledge and belief.

Sworn before me, this day of 1852.

Justice of the Peace.

Affidavit of the Assistant.

ss. 1852. being duly sworn, says that he assisted in harvesting, getting out, and ascertaining the amount of his crop of referred to in the foregoing affidavits; and the quantity of was bushels, as stated in the affidavit of the said

Sworn to before me, this day of 1852.

Justice of the Peace.

JOHN W. LINCOLN, *Chairman.*

Average Cost of Grain and Root Crops, in Hampden County.

Hon. M. P. Wilder, *President of Mass. Board of Agriculture.*

Dear Sir:—Having forwarded to you a copy of the transactions of the Hampden Agricultural Society for the past year, I am induced to offer some further statistics connected therewith, and which would have been presented in connection with the other details, had the importance of them been as apparent then as they now appear to my mind. Permit me to inquire if some such statement is not of sufficient importance to be made a *requirement* from every society in the Commonwealth, drawing funds from the State treasury, in their future reports? It appears to me, this method would furnish a much more correct data of our agricultural products and of their *actual* value, than the present very indifferent reports furnish. The inquisitive mind would see at a glance the results, which, under the present system, are ascertained with much difficulty, and the information thus furnished to the commissioner of patents, for the national government, would be more reliable and furnish more satisfactory evidence of the real state of our agriculture, than could be obtained in any other manner. Other reasons will readily suggest themselves, without my enumerating them. I have made a full detail of our premium crops, so that if any mistake has occurred in my figures, it may be detected readily.

Expense of producing Wheat per bushel, in Hampden County.

Horace Smith,	236	bush.—entire cost,	$128	81	per bush.,	54 3-10 ct.				
Justus Bagg,	223	"	"	"	159	74	"	71 2-10 "		
Walter Cooley,	38	"	"	"	23	50	"	62 "		
John Stiles,	37½	"	"	"	17	00	"	45 5-10 "		
	(Add interest on land, to his statement.)									
R. H. Barlow,	44	bush.—entire cost,	$24	00	"	54 6-10 "				
Col. Silas Root,	91¾	"	"	"	60	50	"	66 "		
	(Add interest on land, to his statement.)									
										Average, 58 5-6 ct.
				Corn, per bushel.						
Horace Smith,	350	bush.—entire cost,	$203	50	"	58 2-10 "				
Walter Cooley,	82½	"	"	"	40	75	"	49 7-10 "		
Josiah Hooker,	225	"	"	"	122	25	"	54 3-10 "		
										Av. 54 2-10

				Rye.						
J. Hooker,	39	bush.—	entire	cost,	$25	55	per bush.,	65	1-2	ct.
I. M. Merrick,	95	"	"	"	41	02	"	43	2-10	"
F. Brewer,	23½	"	"	"	8	54	"	36	3-10	"
										Av. 48 cts.
				Oats.						
Horace Clark,	85½	bush.—	entire	cost,	$13	00	"	15	3-10	"
J. H. Demond,	82	"	"	"	22	28	"	27	2-10	"
										Av. 21¼
				Carrots.						
J. Carlisle,	538	bush.—	entire	cost,	87	50	"	16	2-10	"
S. Warner,	237	"	"	"	31	00	"	13		"
M. Hitchcock,	240	"	"	"	26	75	"	10	4-10	"
										Av. 13 2-10
				Turnips.						
Hitchcock,	160	bush.—	entire	cost,	8	31	"	5	3-10	"
Hooker,	500	"	"	"	22	00	"	4	5-10	"
Warner,	450	"	"	"	18	50	"	4	1-10	"
										Av. 4⅜ ct.

If the facts here communicated should furnish any suggestions of interest, my purpose is fully accomplished. I will only add, I think our average on rye would not be sustained by our general products. My opinion would suggest forty or forty-two, as a more correct average.

Excuse the liberty I have assumed (as a stranger) in addressing these remarks to you, and believe me,

With much respect,

Your humble and ob't serv't,

FRANCIS BREWER,

Springfield.

Agricultural Implements.

In the progress of civilization, in the advancement of the sciences and the arts, and in all that has a tendency to elevate the condition of man, there have been certain distinctly marked periods when the people have given their thoughts to some one or two subjects, and made them prominent beyond others. Not that all study and reflect particularly upon these topics, but that the leading minds do, and through their researches the whole public mind is, in a greater or less degree, imbued with a desire for more knowledge in relation to them.

During the last half century, no subject has more engaged the attention of thinking, practical men, than the improvement of machinery. Under this general head, may be properly classed all the implements of farm husbandry. In our country, more perhaps than in all the world beside, has this spirit of improvement, this constant striving for something better, wrought out results useful to man. Our government and institutions are well calculated for the development of individual genius and enterprise; and to this individual thinking and acting, may be referred the glorious results which have been attained.

Genius is not pent up by arbitrary rules, edicts or censorships, to break out here and there like an impetuous torrent, but finds vent in all directions, and thus every department of industry is benefited. It is seen in works of art, where great natural obstacles are to be overcome. Combined with wealth, it spans rivers whose perpendicular sides and deep abyss, have mocked the daring and skill of former ages, or bids the mountain yield a passage through its rocky bosom. The old machinery, both of sea and land, stands back mute and motionless, in astonishment at the modern queer ways of grinding, reaping, threshing, pumping, pulling and wheeling, and all manner of locomotion.

Man's inventive genius never tires—the inventions of one only exciting the genius of another to supply a defect or add an improvement. It is this stimulus which has brought the steam-engine to its present wonderful state of perfection, and produced similar results with other machinery—with our reapers, ploughs, harrows, and most of the implements of the farm.

The quality of any work, in whatever art, depends mainly on the tools with which it is wrought. The most skilful shoe-maker, with a superior piece of leather, cannot make a good boot, unless he have a good awl, good thread, and a good knife; and the ship builder not only needs the right kind of timber, but the right kind of tools. It is so in every art. In farming, good land will avail but little with a plough that does its work in an imperfect manner, and the farmer would find that he was far behind his neighbors both in quality of work

and time, if he was without a harrow, or if he should use the flail or horse's hoof, instead of the threshing machine, upon large quantities of grain.

If his plough turns the furrow, so as to preclude the atmospheric influences, or breaks it into disjointed masses, his crop is materially affected by it. The whole action of the plough depends upon a shaping so precise, that a very accustomed eye cannot ascertain without trial whether a plough is rightly turned or not. Again, the operation of the plough depends upon the kind of soil to be turned. The heavy ploughs made for the strong and hard soils of New England, might prove of little use on the mellow vegetable mould, that constitutes the prairies of the West. In Massachusetts, many of the farms are so small that the sickle and flail may still be used; while in Illinois, Iowa, or Missouri, the use of either would be looked upon as strange, and excite as much wonder, as would Noah's ark, with its inhabitants, drifting into the harbor of Chicago, or working up stream, against the current of the Mississippi, into the port of St. Louis.

The plough is the implement of the most importance on the farm; and the improvements made in this article, within a few years, especially in the draft and in the adaptation for subsoiling, must produce great and beneficial results in this State, which will show a new and more smiling face on our ancient mother, in the latter half of this century.

It is but a short time since the discovery was made that large portions of our best and most fertile lands, were neglected and unproductive. Experiments were made on a small scale, to reclaim meadow lands, in the Irish fashion, with the hoe; then the common plough was introduced, but both proved inadequate to the labor. It was found that the cost of subduing in this manner, was so great, that few proceeded in the attempt. But enough was accomplished to reveal the fertility of these lands, and to excite an inquiry how they could be reclaimed at a remunerating cost. Methods were soon devised not only to plough meadows that were hard, but those inaccessible to the team on account of their softness. The pulley, rackets, and meadow plough with double share, have added some mil-

lions in value to our New England soils. This plough cuts the entire under surface of the furrow, from the subjacent soil, and enables the mould board, with the aid of the ploughman's foot, entirely to reverse it. From the elasticity of the meadow sward, filled as it usually is with innumerable roots, no other implement has been found equal to the meadow plough, in the work of reclaiming our meadow lands.

The use of horse-power, for the purposes of cutting and harvesting grain, for ploughing and other operations, may very probably, before many years, be superseded in a measure by steam power. The idea has been already suggested, and some attempts have been made to carry it into practical operation. It would seem that steam power could only be applied successfully to ploughing, by running the plough on wheels, as is done in some parts of Europe, and in the prairie plough in the West; and then that it could not be used to advantage except on level, or nearly level lands, free from stumps and large stones. Some experiments were recently made in England with the plough, subsoil plough and harrow, operated by steam power, all of which are represented as fully answering all reasonable expectations. The ploughing took place on old lands, having some dips. In one experiment, four acres were ploughed in ten hours, and might have been subsoiled at the same time, making the amount ploughed nearly an acre an hour. The relative expense of ploughing twenty-four acres, is found by that trial to be, by horse power, $44 23, and by steam power, $30 75, making a difference in favor of the steam power in ploughing the twenty-four acres, of $13 48. We can hardly realize that it will ever be of practical use in New England.

After the most judicious selection of a plough, the work will be quite likely to be badly executed, unless the principles of draft are understood. "So great is the difference between an awkward and skilful adjustment of the draft to the plough, that some workmen with a poor instrument have succeeded better than others have with the best; and ploughs of second quality, sometimes for this reason, have been preferred to those of the most perfect construction."

Perhaps the object of the Massachusetts State Agricultural

Society, in instituting the ploughing matches at Brighton, was principally an improvement in the breed of working oxen. Yet so slow were the competitors in those honorable and useful contests, to allow of any deficiency in their animals, and to lay upon them the stigma of defeat, that they were led to most searching examination into the structure of their ploughs, to which they were not willing to charge it. The result, therefore, has been successive improvements in the plough. A general impetus has been thence communicated to the whole art of agriculture. Improvements and inventions have abounded. New implements have been invented, old ones improved, and thus a better tillage has been produced, and greater facilities in harvesting have enabled the farmer the better to save his crops.

Another indispensable implement upon the farm and one of great practical utility, is the harrow. This instrument naturally follows the plough in farm operations, and although scarcely less important, in the service which it renders, than the plough itself, has not seemed to obtain that attention which it deserves. Indeed, while constructed in the manner in which are most of them now used, they will gain few golden opinions from intelligent men. Their great objection lies in their weight. They are too heavy and are moved too slowly. In order to pulverize the soil thoroughly and leave it in fine and delicate tilth, it is necessary to use a light harrow, with sharp teeth, and to move it quickly over the ground. "If we examine a field, one half of which has been harrowed by weak, inefficient horses, and whose pace was consequently sluggish, the other half by an adequate strength and swiftness of animal power, we shall find the former will be rough and unfinished; the latter comparatively fine and level, and completed in what would be called a *husbandry-like* manner." On meadow sward, that is filled with roots of small bushes and coarse grass, a light harrow with sharp teeth, moved rapidly over the surface, cuts the roots apart and brings up the fine, light soil, admirably prepared to receive grass seed; while a heavy instrument, slowly moved, would turn up innumerable sods, and do little towards pulverizing the surface. "Many would be sur-

prised, who have never made the experiment, at the amount of reduction of which seed harrows, at least, are capable; and where land is clear, to see how effective very light small toothed harrows, may be made." In an experiment made between a pair of wooden harrows, and a pair of iron ones, constructed alike, although the iron ones were twenty pounds the lightest, yet they worked decidedly better and steadier than those made of wood. It seems to be requisite to have the desired weight in the most compact form; the instrument performs its work easier and better, while it is more conveniently handled by the operator.

The horse rake, in its various forms, has proved itself of great service. One patented by a Mr. Delano, of Maine, has been considerably used in this State, and is scarcely excelled by any labor-saving machine in use on the farm. Its teeth act independently, thus adapting itself to all surfaces, and the operator rides as he rakes. The process of raking is rapid, thus enabling the haymaker to leave his spread grass to the benefit of the sun, until a late hour in the afternoon, and frequently to get it in on the same day in which it is cut. It is cheap, simple in construction, and durable.

A horse-mowing machine, and a machine for spreading swaths, are implements much wanted, and are inviting subjects for the inventive genius of some of our citizens.

There are questions of great importance to be settled, with regard to the smaller implements. It may be asked, what weight and breadth are the most advantageous for the hoe? Undoubtedly they should be such that the person using it, could make the greatest number of effective strokes in a given time with the least fatigue. Hoeing is a laborious work, for the reason that the body is held in a bent position, which requires a constant, sustained effort, of the muscles of the abdomen and back, to hold up the great weight of the trunk, shoulders and head. The hoe should have the least weight consistent with the strength and size required for good work, and in order to be as light as is convenient, should have the least width that is sufficient for economical use. "The laborer, who makes, with a common hoe, two thousand strokes an hour,

should not wield a needless ounce. If any part is heavier than necessary, even to the amount of half an ounce only, he must repeatedly and continually lift this half ounce, so that the whole strength thus spent, would be equal in a day, to twelve hundred and fifty pounds, which ought to be exerted in stirring the soil, and destroying the weeds."

The same principle is applicable to most of the other small implements of the farm. Great improvements have been made in the shovel and manure fork. It is probably safe to say that nearly double the amount may be accomplished in a given time with a six, eight, or ten-tined fork, in most kinds of work where a shovel has formerly been used, than can be done with the shovel itself, and this, too, with greater ease to the operator. And to use the forcible language of another, "in no direction can we grasp more aid than in gathering about us all good and necessary tools. Parsimony here is ruin; a liberal and judicious expenditure is a precursor of success."

The patent laws have been a powerful auxiliary to the efforts of the agricultural societies, in stimulating the ingenuity of inventors. By securing to the inventor the exclusive benefit of his invention, they enable him to enrich himself, while he is benefitting the public. Agriculture owes many of the most useful inventions, designed to facilitate the labors of the the farm, to this healthy and proper stimulus furnished by the laws.

If our fathers fifty years ago, had foreseen the amount of immigration to this country, instead of making laws to protect patent rights from infringement in order that ingenuity and labor might reap their due reward, they probably would have enacted stringent laws against inventions, in fear that the laborer would be thrown out of employment and come upon the parish for support. Cotton cloth was then thirty or forty cents a yard; a girl's wages fifty cents a week. Now a girl's wages are often three to five dollars a week, which will purchase forty or fifty yards of cloth. The inventive genius of the country seems to be, for the most part, concentrated in New England, though some of the most beneficial inventions have started in other parts. And the inventive power of the people of New

England, has been turned very much to improvements in farm implements. Since our great political revolution which made us a nation, changes almost as great have been wrought out in the field of agriculture. Principles in vegetation then unheard of, or just beginning to be known by a few searching minds, have been more fully established and published to the world.

No subject can be presented to the notice of the agricultural societies and of this board, more worthy their attention, than the construction of farm implements, and improvements therein. Even the form and weight of so small an instrument as the hoe, might be a profitable subject of earnest and mature discussion, and a series of experiments like those of the ploughing matches, which have brought about so much improvement in the plough. The adaptation of the various tools and machinery used in the field to fulfil their design most thoroughly, by their capacity of doing the most work and in the best manner, with the least fatigue to the operator, can hardly be the subject of too much examination. All such examinations, though attracting but little public attention, may work out most substantial benefits.

The whole subject of farm implements, in all its bearings upon the labors of the field and the effect of those labors on the condition and improvement of the art, and on the value and beauty of the hills and valleys of the State, as well as upon the prosperity and happiness of the farmers, cannot be overrated.

The soil of Massachusetts is for the most part rather forbidding, while the advantages for commerce and other pursuits, have held out to our citizens inducements to engage in such employments, as would, (in their imagination) better repay time and industry, and give a larger profit to capital invested. Those who have staid by the sod, have done well. They have always, when industrious and skilful, gained a competent support, and some have saved small fortunes. But the cultivation of the soil here, undoubtedly requires more toil, skill and expense, than in some other states. We have, however, the comforting assurance of writers on political economy, that a hard soil is favorable to the best development of the intellect, and

that good morals thrive best, where the products of the land require the most care. In proportion, however, to the ungenial quality of the soil, is the advantage of machinery and implements adapted to lighten labor and assist the work. In no part of the country, therefore, is this subject of implements more important than here in our own State.

"The United States present a wide field for the operations of skilful artisans in all useful as well as ornamental articles; as their wealth increases so do also their taste for the elegant and beautiful, and their desire to possess what will minister to the refinements of life. This is ever the case with nations as they advance in intellectual power, and in the first appreciation of what confers real dignity on a people; and their moral strength keeps pace with their progress in intelligence."

During the last fifty years, as was remarked in the outset, the mind has been preëminently active in seeking out new inventions. It has also had its period to soar to the heavens in search of new planets, mark the time of their coming, and tell us when their far-off light shall first touch our earth;—to explore fathomless seas and penetrate deep bays and inlets of frozen zones; it has outstript the fancies of the poet, in passing "a girdle round the earth in forty minutes." Marvellous works has it wrought in steam and electricity; probed deep into animal physiology, given us new limbs in surgery, and finally thrown us into a temporary death in order to haul up our shattered frame for repair of damages.

But at present the mind's popular idea is agriculture. The decrease of crops on most of our old lands, with the rapid increase of population, has arrested the attention of many earnest and intelligent persons. The inquiry everywhere is, What shall be done to increase the fertility of our impoverished acres, and bring a more ample reward for the labor bestowed upon them? Our answer is, more light,—a more intimate knowledge of the laws and operations of nature, and a more careful and skilful cultivation of what we undertake.

SIMON BROWN, *Chairman.*

Manufactures.

We have considered this subject in several points of view, and have found, in each of them, strong reasons for the encouragement of manufactures by the agricultural societies of this Commonwealth.

There is an obvious and necessary connection between all the arts of life, and the interests of each are best promoted by sympathy and harmony of action with all the rest. Manufactures are, in a very important degree, linked with the interests of agriculture. They proceed from, stimulate and recompense the labor, skill and enterprise of the farmer. He must produce the raw materials, to be converted by the manufacturer into fabrics, which the community requires for comfort and health. His cattle-yard, sheep-fold, stye, poultry-yard, dairy, orchards and fields, are all needed tributaries to the general stock, which supplies every article of food and clothing, of comfort and luxury. Our houses, in every part, and in all their conveniences; our implements of labor, and our means of conveyance, remind us of the necessary cultivation of the soil. The traveller, and he who dwells at home, the manufacturer, the mechanic and the merchant, have all frequent occasion to feel their indebtedness to those interests, which it is our immediate object to foster and encourage.

Without pursuing this obvious thought, we proceed to remark, that by suitable attention to manufactures, and a generous encouragement of every effort to multiply and improve them, we shall contribute directly to our own advantage. The aid we shall lend will, of necessity, be returned in the large consumption of the products of the farm and the garden, and in a corresponding increase of the profits of cultivation.

Nor is it less obvious, we conceive, that a free and generous supply of those articles which the manufacturer can contribute, must enhance, in a great measure, the attractiveness and the profits of our annual exhibitions. There are many who usually attend these exhibitions, to whom no objects can be presented more gratifying than such contributions. We have noticed

the closest and apparently gratified attention to the often elegant specimens of cloths, shawls, hosiery, carpeting, &c., which have graced our halls. We have watched the diligent inspection of the implements of husbandry, the articles for the dairy, the labor-saving machines for domestic operations, the boots and shoes, the hats and bonnets, the carriages and harnesses,—the curious and the useful inventions, which were here displayed. We have seen crowds of eager spectators, around the table laden with the fruits of female industry, taste and skill. And were either department to be neglected, or but meagerly supplied, the consequence would be no less marked and injurious, than if the products of the dairy, the garden and the field were wanting, or but scantily collected. It would seem, therefore, to be at once the duty and the interest of our societies, to increase, by suitable attention and encouragement, this important feature of our annual exhibitions.

Again, we conceive that the industry, skill and enterprise, which are necessary to the production of such manufactures as we would desire to see at our annual exhibitions, are intimately and largely connected with the general education, refinement and happiness of society;—an object most worthy of all encouragement, and most likely to act, with reflex influence, upon the interests of all who shall aid in promoting it. In the factory, in the workshop and at the fireside, are those elements formed and put in exercise, which are to refine the character, and swell the prosperity, of the community, by which our labors are to be appreciated and recompensed. We cannot do less, therefore, than offer every suitable inducement to multiply and improve the productions, to which such elements give birth. The neglect, or the low estimation of them, would be alike unjust and detrimental.

Observing that the duty assigned the committee, excludes the consideration of several articles of manufacture, in which the farmer is most interested, we invite attention to the following table, in which are embraced many articles not hitherto common at our annual exhibitions, but at all times a desirable contribution to them. The premiums which are offered as an encouragement and compensation for the display of them, will,

of course, vary in amount, with the pecuniary resources of the respective societies that offer them.

Manufactures of Cloth, Hosiery, &c.

Best piece of cotton cloth, not less than 30 yards.
" " " cotton prints, " " " " "
" " " cotton chintz, " " " " "
" " " cotton flannel, " " " " "
" " " cotton and woolen dress goods, not less than 30 yds.
" " " tapestry carpeting, not less than 30 yards.
" " " Brussels carpeting, " " " " "
" " " ingrain carpeting, " " " " "
" " " stair carpeting, " " " " "
" hearth rug.
" piece of broadcloth, not less than 25 yards.
" " " kerseymere, " " " " "
" " " woolen dress goods, not less than 30 yards.
" " " flannel, not less than 30 yards.
" pair of woolen blankets.
" woolen shawl.
" specimen of woolen shirts.
" " " woolen drawers.
" 6 pairs woolen hose.
" " " woolen half hose.
" 2 " silk hose.
" " " silk half hose.
" counterpane.
" bale of cotton or woolen wadding.

The above-named articles must have been manufactured in the county within one year. The articles, made in the *family* of the person presenting them, will receive particular consideration, and, if worthy, an additional premium.

Manufactures of Leather, &c.

Best pair of thick boots.
" " " calf skin boots.
" " " thin boots, other than calf skin.
" " " kip boots.

Best pair of thick brogans.
" " " fine brogans.
" " " ladies' walking shoes.
" " " ladies' slippers.
" riding bridle and saddle.
" single chaise or carriage harness.
" double chaise or carriage harness.
" specimen of finished calf skin.
" " " " kip skin.
" " " " morocco.
" " " " sole leather.

Miscellaneous Articles.

Best specimen of shell combs, not less than six.
" " " horn combs, " " " "
" " " men's hats.
" " " children's hats.
" " " men's caps.
" " " children's caps.
" " " silk umbrellas.
" " " gingham umbrellas.
" " " straw bonnets.
" " " straw hats.
" " " straw braid, not less than 100 yards.
" collection of wooden ware.
" " " earthen ware.
" " " stone ware.
" " " tin ware.
" " " glass ware.
" " " iron ware.
" specimen of coopers' work.
" " " horse shoes.
" " " ox shoes.
" " " sperm candles, not less than 10 lbs.
" " " stearine candles, " " " " "
" " " tallow candles, " " " " "
" " " soap, washing, " " " " "
" " " soap, fancy, " " " " "

Best specimen of pleasure carriages, (single.)
" " " pleasure carriages, (double.)
" " " wagons, (covered.)
" " " wagons, (open.)
" " " starch, corn.
" " " starch, potato.
" " " starch, wheat.
" " " farina.
" " " prepared oats.
" " " prepared barley.
" " " wheaten groats.
" " " mustard.
" " " pickles.
" " " preserves.
" " " catchup.
" " " Indian meal.
" " " rye meal.
" " " wheat meal.
" " " buck wheat.
Not less than 50 lbs. of each, in clean bags.
" " " wheat bread.
" " " rye bread.
" " " Indian and rye bread.
" " " Indian and wheat bread.
Not less than 2 lbs. of each, (with special regulations.)
" " " churns.
" " " butter workers.
" " " butter stamps.
" " " lard, not less than 10 lbs.
" barrel superfine flour.
" " rye flour.
" specimen of glue, not less than 10 lbs.
" cooking stove.
" parlor stove.
" farm boiler.

Any specimen of work performed by a child under 12 years of age, exhibiting industry and ingenuity, shall, if worthy, receive a premium at the discretion of the committee.

Any specimen of embroidery, or other fine needle work,—of drawing, etching, or painting,—of ornamental, or of useful work, not otherwise provided for, shall, if worthy, receive a premium at the discretion of the committee.

Every article, to be entitled to a premium, must have been produced in the county within one year. And no article, which has received a premium in one place, shall be entitled to the same in another.

For the Committee,

CHARLES C. SEWALL.

SELECTIONS FROM ADDRESSES

TO

AGRICULTURAL SOCIETIES.

Some of the Obstacles which have Impeded the Progress of Agriculture, and the Mode in which its Improvement can Specially be Promoted.

[*Extract from an Address by* Rev. Milton P. Braman, *at the last Fair of the Essex Agricultural Society.*]

I. The situation and employment of the farmer have not hitherto furnished him with that stimulus to mental activity and effort, which has been applied to many other classes. Agricultural operations are so simple as to require no great exercise of ingenuity and length of practice to learn to perform them. The spade, the plough, the scythe, the sickle, demand no long apprenticeship, little teaching and a small degree of dexterity to acquire a competent use of them. The modes and seasons of planting, sowing, reaping, gathering, when once ascertained, can be comprehended in a very short time by the most moderate capacity. Every boy in rural places learns the current practice without any effort of attention, or direct teaching, by observing what he cannot avoid seeing, and as a matter of course, just as he acquires the knowledge of trees and stones, and earth and water, and the obvious effects of sun and rain, and the most common objects and processes about him. Strength of muscle and bone, and the power of hardy endurance, are more essential for the ordinary processes of farm labor, than natural ingenuity or skilful training. But the case

is quite different with respect to the mechanic arts, some of which demand the assiduous and well instructed preparation of years to acquire the power to produce the most ordinary and usable fabrics which it is their appropriate business to furnish to the community. What a difference between the mechanical ingenuity necessary to frame a dwelling-house, and that required to prepare the ground for planting! What superiority of mental and manual pliability is employed in the construction of a watch, over that bestowed on the use of the spade and the sickle! Those wooden clocks which New England pedlers sell in Nova Scotia, and which need one hand and a crank to turn the wheels, are specimens of workmanship, which exhibit the results of a much more lengthened and devoted preparation, than the use of any implement of agriculture whatever. There is scarce any branch of mechanic art, or of manufacture, the training and practice of which do not necessarily call into action more of the mental attributes of man, than the common operations of the field. Now the exercise of the intellect in one direction gives strength to all the powers. The discipline of the understanding in any form adds to its general tone, elasticity and extent; and thus the employment of those engaged in the mechanic arts, has given them an advantage over those who are occupied in the more simple labors or rural industry. When we consider the difference in the nature and mental influence of these two classes of pursuits, we see some reason for the opinion which has gained prevalence, that those who bestow their attention exclusively upon soil, are less active in their intellectual habits, less inquisitive, have less aptitude for making improvements, or adopting those suggested by others, than those who have devoted themselves to other branches of manual labor.

There are some kinds of manufactures that exert the same influence in a more indirect form. The powers that move them, render their operations exceedingly rapid and exciting. The incessant whirl and noise of the machinery, the quick movement on the part of those who exercise superintendence to supply the material for process, and regulate the work, the close attention demanded, the regularity and precision and

despatch with which every part of the fabric is elaborated and brought into shape, communicate corresponding impressions to the mind. The ideas of operatives are moulded by the processes about them, and acquire an energy, order and quickness which give a new cast to the intellectual character. Agricultural operations are generally of a slow and quiet nature. They do not admit of the application of that extensive, complicated and rapidly moving machinery, which is made use of in the manufacturing arts. The force of steam is said to have been, in some instances, made use of to move the plough, but then the celerity with which it is drawn through the furrows, must be limited by the power of speed in the person who follows. Unless an apparatus should be invented which should sustain and guide itself, or admit of being directed by a person to whom it should at the same time serve as a conveyance, the use of this wonderful agent, for such purposes, is of questionable practicability; and even then, it could be employed only in those smooth and clear soils, where no fast stones and other impediments exist, to render a rapid progress destructive to the implement.

Now the mental habits of the farm laborer, take, where no counteracting circumstances exist, the cast of his employment. The slow manner in which it is conducted, and its unexciting nature, exercise an assimilating influence upon his temperament. The ox has little elasticity in his movements. The farm horse has a reputation for spirit, certainly not high. The processes of vegetation are so gradual as to make growth imperceptible, so silent that they emit no sound to the acutest ear. How different in their character and effects on those with whose pursuits they are connected, from the water-fall and the propelling wind, and the steam engine, and the swift revolving wheels, and the whirling spindles, and the unceasing din which turn the very brain into a locomotive, and strain the nerves to as high a tension, as the thread is twisted into strong and tenacious fibre, from the loose filaments of cotton.

There is a difference between agriculture and some other employments, derived from the diverse situation in which they are pursued. A large portion of manufacturing operations is

conducted in places of compact population, where men, living in close connection, act powerfully on each other's sympathies, and those principles of imitation and emulation, which hold such sway in the human breast, and impart such great energy to intellect and character. These observations have a close application to trading and mercantile pursuits. They are necessarily carried on to a great extent in large and crowded places, where human passions communicate themselves with great rapidity; where enterprise, and skill, and talent are awakened into vigor by contact, and stimulated by the keenest competition of selfishness. The trading establishments in small villages and rural districts, bring their superintendents into constant communication with men of all varieties of disposition and intelligence, from places more or less remote; where subjects are discussed, ideas are exchanged, information communicated, and the mind is kept in a state of excitement and activity.

The political affairs of the nation are discussed in these places of village resort, with more good sense than they are sometimes treated in higher places, and the business which it has taken a whole session of Congress to discuss, and another to decide, is there completed in one evening's debate, quite as well in some cases, if not so authoratively, as in the spot where the supreme power of the nation resides.

But the operations of husbandry require an open space, are conducted in a more sparsely settled region, without the limits of those centres of congregation, and human contact and competition, and those influences which quicken ideas and rouse the energies to action.

2. A good deal of talent and energy are withdrawn from agricultural employment into other business, which holds out inducement of quicker and larger profit. The difference which exists between agricultural and mercantile occupations, is generally conceded to be this, that while the former holds out prospects of steady, safe, but slow and moderate returns, the latter invite by the chances of sudden and splendid fortunes, united with a very large proportion of entire failures. Now it would be the dictate of true wisdom to prefer generally the

safer and less brilliant path to that which proposes a few magnificent prizes, and an immense number of blanks. There are, it is true, those who possess such a strong aptitude for mercantile life, whose genius for trading speculations is so remarkably developed, and who have such a great confidence in their powers, that their course of life seems to be pointed out by indications too plain to be mistaken; and the probability of success preponderates manifestly in their favor. But considering the monitory disclosures which have been made on this subject, the larger portion of those who embark in the pursuits of trade are mere adventurers. They hazard their fortunes on the most uncertain risks. The experiment which they make is like the purchase of a ticket in the lottery; it is worse than that even, it is a California speculation.

A magnificent prize in a lottery, a successful adventure for gold in the mining regions, will awaken the aspiration of thousands; they shut their eyes to the vast number of the disappointed, and are overpowered and seduced by one of the few instances of good fortune. So the comparatively few, who, resorting in early life to the cities for trading purposes, make their way up to the golden summits of ambition, will draw after them a crowd of the young, ardent, and ambitious, who abandon the less perilous and less fascinating toils of rural life, to plunge into mercantile uncertainties in which so many are overwhelmed to rise no more.

The attractions of a city life are motives of powerful operation with many, whose tastes lead them in that direction. They have no fondness for rural scenes. The green fields, the winding streams, the waving trees, the flowers of spring, hill and dale, and all the majesty and beauty of nature, have no charms in their eyes equal to the crowded streets, and buildings of lofty and costly proportions, and glow, and bustle, and gaiety, and splendor and fashion, and social enjoyments of a populous city.

The wish to escape the manual labor of the field is a strong passion. Work *there, is* work; it is disagreeable on account of its severity, its uncleanliness, its exposure to the sun and air, and those various influences which are inconsistent with the

desired grace, niceness and delicacy of personal appearance. There are many young men who have feminine propensities. They have that inclination for the pretty, ornamental, and showy in person and dress, which nature intended should be the exclusive property of the other sex. They interfere with the female prerogatives, as much as some of those whose domain they invade, do in their aspirations after a more gentlemanly appearance. Since the ladies have begun to wear working jackets and pantaloons, and have exchanged the bonnet for the hat, I am greatly in hopes, as the only advantage which is likely to grow out of such a metamorphosis, that those young men who have such pretty tastes will permit them to take a more rational direction, and that in their endeavors to imitate the ladies, they will become as *manly* as they are.

Agricultural labor has not, in the view of some, the requisite dignity and rank to satisfy their ambition. The fact that the mere practical operations of farming demand so little training and skill to conduct them, places the occupation in a lower grade than the arts which require long apprenticeship, and much tuition to practise them with the necessary degree of success and profit. The skill associated with the exercise of the craft gives it higher association and a loftier position. When, as in some mechanical employments, you have great expenditure in preparation, fine and costly material, extreme nicety of workmanship, and rich and valuable products destined for ornament and elegant use, you see an employment which presents much higher attractions to those who are actuated by aspiring views, than belong to the more simple and rural exercises. The young man who enters upon such a line of life, feels himself above the rustic laborer; as much superior in some of the finer attributes of humanity, to him who delves in the ground, as the instruments with which he works, surpass in their exquisite and delicate structure, the heavy plough; and the gold and silver which are wrought into forms of convenience and beauty by his hand, exceed the coarse earth beneath his feet.

There is no country on the earth where this ambition to rise to higher grades in life, real or imaginary, is more strong

than in ours. The people seem to have the same convictions respecting their own properties that Moloch expressed of his compeers in Pandemonium, that "in their proper motion ascend."

Every man feels that he is equal to every other, and that nature has provided for him some high position which it is the great mission of his life to find, and that no American has found his right place, as long as there is another individual above him. Agriculture pays the penalty of this universal and boundless competition. A great amount of ingenuity, activity and enterprise, which ought to bestow their benefits upon the soil, are forced into other channels of industry which promise higher rewards to the impatient aspirations of the American mind.

3. Another reason for the slow progress of agriculture, in this country particularly, is the immense quantity of uncultivated and fertile lands which have held out constant invitation to emigrants from the older settlements. The stimulants to a more inventive and vigorous agriculture are withdrawn. It is found easier for a person who has a taste for the labors of the field, to go a thousand miles and reap an almost spontaneous harvest from soils that have been growing richer since creation, than to turn the stone of the New England hills into bread. And then as larger proportions of waste land have been brought into culture, and the facilities of transportation have been multiplied, and a greater quantity of surplus products has been thrown into our markets to compete with those of domestic culture, every year has laid a still heavier tax on the ingenuity and exertions of the agriculturists in the older regions to extract an adequate return from mould of stubborn and ungrateful qualities. This demand in other circumstances would have operated favorably; it would have called forth correspondent effort; it would have developed resources equal to the crisis; and though no more sunbeams might have been obtained to warm the earth, than the sun is pleased to dispense, they might have been put to more economical and efficient use in perfecting the process of vegetation.

But to those having the migratory propensities so strongly

infixed in the minds of the American people, the possession of new and rich soils, presents irresistible attractions. It is to no purpose to attempt to dissuade them from their enterprise, by an exhibition of its difficulties and privations. They find it more easy to surmount them, than to call into existence the skill and resources necessary to obtain such a livelihood and position as they are ambitious to obtain here. When a person is told that with the same effort he can arrive at as good a condition in Connecticut and Massachusetts, as on the western frontier, it does not satisfy him. He acts on the maxim of Cæsar, that it is better to be the first man in a village, than the second in Rome. He is willing to live in a log house where his neighbor lives in a log house too. But to occupy such a dwelling, where others dwell in framed and ceiled houses, offends his notion of republican equality. We must be reconciled to such a state of things. The feeling, though it may be extravagant and misdirected, is the legitimate offspring of our institutions. It is a feeling which tends to elevation and respectability of character, it prompts to self-denying efforts, it is a preservative from degrading vice, and one of the great safeguards of that sense of dignity and the virtuous self-control, which belong to the foundations of American liberty.

4. Another circumstance which has retarded the advance of agriculture has been a want of chemical knowledge. It is only about a hundred years since the foundation of the science of modern chemistry was laid by Dr. Black, of Edinburgh. Previous to that time this branch of natural philosophy was in no condition to render any service to the tillage of the ground. And indeed it was not till a considerable period subsequent, that application was made of its newly discovered principles to that art in which it is destined to effect so wonderful a revolution. Within fifty years the science has assumed an exactness, and made a progress, and taken a prominence, to which nothing in its previous history bears any comparison, and upon which are founded the highest expectations of its future development, and the immense benefit which it will confer upon mankind. Probably no important interest of humanity will receive greater advantage from this department of

research than agriculture. The composition of soils, the elements which are combined in vegetables, the requisite ingredients for fertilizing agents, the presence or deficiency of particular qualities in the earths, which rendered them adapted or unadapted to the production of certain descriptions of plants, and whose very existence was unknown for thousands of years, seem so essential to a successful tillage, that it is a matter of wonder how observation was so well able to remedy the want which chemical investigation is destined to supply. It has already rendered vast benefit to the cultivation of the earth; and yet agricultural chemistry is still in its infancy. It is just laying the foundations of a mighty superstructure. What then will it not effect when it has advanced to the full maturity of improvement? A hundred or even fifty years more of progress with the increased activity of the human mind, and the increased facilities for discovery proportionate to that which the last century or half century has witnessed, will renovate the face of the earth, and produce results which would now seem almost like the effects of supernatural power.

The contempt with which some interested in the progress of agriculture, and possessing intelligence, look upon the pretensions of chemistry as an assistant to the farmer is quite astonishing. There is not a single process of vegetation that does not involve chemical laws and principles. The soil and the atmosphere are a great laboratory in which nature is constantly performing changes that professors of the chemical art are endeavoring to imitate by those experiments, in which the laws of science are attempted to be set forth to their pupils. Until a person can prove that the agriculturist has no occasion to ascertain the elements and qualities of the soil which he cultivates, or the ingredients which enter into the structure of the plants he rears, or the nature of those processes by which the elements contribute to the growth of vegetation, he cannot prove that chemical science is not a most valuable assistant in the art of tilling the ground. Why, all the practical knowledge which centuries of observations have collected on the modes of tillage, is the embodiment of so many facts in agricultural chemistry, upon which farther investigation in the

science, has thrown explanation. Chemistry as applied to this art is a collection of facts and explanation, which are themselves only additional facts, relating the best methods of securing the greatest quantity of the most perfect products from grounds of a certain quantity and quality, and it is nothing after all, but an increase of that very kind of knowledge, without which a farmer could not perform a single operation in the line of his employment. Is any man frightened at this? then let him take his place among the astrologers and star-gazers, and regulate his tillage by the almanac and the moon.

I have thus mentioned some of the obstacles which have impeded agricultural progress, and the list might be enlarged. I proceed to notice one of the modes in which improvement in agriculture can be promoted.

This is by agricultural schools, taught by men versed in all sciences connected with the cultivation of the soil, and to which lands are attached for the purpose of experimental and practical farming. The attention which this subject can receive in the common school must be of quite an elementary and general character. Whilst the knowledge gained in this way is useful as far as it goes, it does not meet the present demand. The common school is already so crowded with studies which are thought to be indispensably important branches of education, that there is a strong tendency to want of thoroughness to, and superficiality in the manner of teaching those which are of the first necessity and lie at the foundation of all knowledge and mental discipline. Besides, among the thousands of teachers who resort to school keeping, as a mere temporary employment in the younger period of life, with minds comparatively immature and unfurnished, and upon whom our common schools must depend for an indefinite period, how many are qualified to teach any more than the mere rudimental and general parts of the science, from meagre text books, prepared for the purpose, without the aids of experiment and practice which will be furnished by the proposed schools, and are of such vast importance, to complete the preparation of those who are destined to the employment of husbandry? The system of common schools must undergo a complete revolution, and become very

different from what it is now, or will probably become within any period of reasonable computation, before it will meet the exigency of the case and satisfy the demands of agricultural education. There can scarcely be conceived anything more impracticable and visionary than the projects of some who propose to employ our present system of free schools, as an instrument to diffuse the necessary degree of agricultural science among the people. They might as well be metamorphosed into colleges and universities, into schools of law, medicine or theology, to teach the whole circle of the sciences and prepare young men for the three professions, as to take the place of those agricultural seminaries, for which there is such an imperative call in the community.

The proposed schools offer the following advantages:

1. The teachers will be men exclusively devoted to investigations connected with an improved state of cultivation. We have few or none of this description among us. We have learned professors of chemistry, mineralogy, botany, whose profound researches into sciences which it is their business to illustrate, have been of inestimable advantage to the concerns of agriculture. But if we could have gentlemen of equal intellectual character and attainment, placed in situations whose duties require them to pursue the study of these sciences, with reference to the cultivation of the soil, they would contribute in a much greater degree to the improvement to which the present occasion is devoted.

There is, it is true, great complaint that the recommendations and theories of scientific men, are frequently of no value to the farmer, because they will not stand the test of experiment; and so practical agriculture, as it is called, is set infinitely above the speculations of learned theorists.

Now the proposition is to establish schools in which the theoretical and practical are combined. Every new deduction of scientific research will be subjected to actual experiment, and tested by successful results, before it is patented for the public use and benefit.

It is also fair to put the question, whether the recommendations of learned men, any oftener fail in experiment, than the

suggestions of merely practical men. A person has only to read an agricultural paper, containing the opinions of those who are fresh from the field, he has only to attend a meeting for discussion, in which he hears modes of tillage advocated by gentlemen who confidently lay claim to have put them to the proof of successive trial, and see how common it is for them to be in direct conflict with each other; and for one to overthrow what another asserts to have been established on the firmest foundations of experience, to be convinced that practice has its uncertainties as well as science. A hundred practical men will earnestly advocate a mode of agriculture which they have proved by the demonstration of experiment, to be the best mode in the world, which a hundred other men, as experienced and wise as they, will in the same manner make it clear, is of no value at all. If science and practice often disagree, neither does practice agree with practice. Practical men have no right to throw this imputation on science, until they have wiped the reproach from themselves.

If all the theologians in the United States were convened in one place to debate their points of faith, and all the agriculturists to discuss their points of practice, I doubt whether it would not come out, that there was nearly as much disagreement in the one assembly as in the other. This I confess to be a strong assertion. How much do practical men differ about the disease of the potato? There have been as many theories about the source of that extensive malady, as have been broached respecting original sin, and what one recommends as an infallible specific, another declares, on the faith and knowledge of a practical man, to be inert and powerless. One objection to agricultural schools, which some assert with much confidence, is, that they will afford their advantages to but a portion of the people. They will not be democratic and diffusive enough in their influence, and while a few will be gathered within their walls, to reap their fruits, the great mass of the people will be left unprovided for, and unbenefited.

In reply to this, it may be said that the number of schools of this description, will be limited only by the patronage which the public are willing to afford them. They may be multiplied

to as great a number as the demands of the people require, and if all the agricultural class choose to enjoy the advantages of such institutions, they can provide themselves accordingly. The additional profit which they would soon be the means of conferring on tillage, would afford the amplest means to erect and sustain them in sufficient numbers to meet all the wants of the community.

But it is not to be expected, for the present at least, that any more than a portion of the agriculturists will feel an inclination to participate in the superior benefits of such establishments. Nevertheless the whole mass of the people will be as really profited by comparatively few schools, as though they were multiplied to a sufficient number to include every individual within their limits. Every part of the country will be represented by those who resort to them, and when they have completed their course of preparation, and retire to their respective homes to enter upon the pursuits which they have chosen, they will exhibit an example of correct and successful tillage which will excite curiosity, attract imitation, and raise the standard of agriculture in all their vicinities. Their new methods of cultivation, their communications with those around them, will stimulate inquiry, gradually diffuse correct and useful ideas, and extend the influence of the school in every part of the community.

It is probable, also, that a multitude of useful publications will issue from the pens of those who are devoted to teaching agricultural science, which, popular in their form, will have extensive circulation; and thus, in one form or another, there will emanate from these institutions, an influence which shall penetrate among the masses, and beneficially reach thousands who have never placed themselves within the sphere of their immediate operation. They will be so many lights which will shed their rays not only upon those who are brought into immediate contact, but diffuse their beams abroad, illuminating remote places, finding their way into obscure recesses, and in a thousand forms of direct emanation, reflection and refraction, pouring out their splendor to the utmost limits of the horizon.

2. Another advantage is, that they will give new attraction

to agriculture as an employment. I have alluded to a class of young men, who seek what they think to be a more elevated pursuit than the tillage of the field. They have an ambition of rising in life, and they very naturally conclude that the further they get from the ground, the higher they fly. Those who unite a thirst for knowledge, with aspiring views, and some who do not, are inclined to betake themselves to the university; and the door which admits them within its walls, shuts out the vulgar toils of the field forever. It is a common observation, that the dullest boy in the family is selected to follow the father's pursuits, on the ancestral grounds, while the one which appears the most vivacious and active is singled out for the college, or some more tasteful and supposed dignified vocation.

Now let the road to the best conducted agriculture be through a scientific institution, let classes of youth go out annually from the tuition of learned instructors, versed in those sciences which are connected with the culture of the earth, let them enter upon the business of farming as young men enter the professions, after graduation at the college, and it would contribute much to raise agriculture to that position which it ought to hold among the other vocations of life; and many who are now a burden to the professions, and are wrecked in the fluctuations of merchandise and commerce, would be found pursuing a safe, happy, and useful course of life. President Hitchcock saw in some of the agricultural schools which he visited in Europe, young men from families distinguished by their opulence and position in life, habited in frocks and performing cheerfully some of the most coarse and uncleanly labors connected with the establishments. Perhaps these individuals were drawn thither by the dignified associations which, in their view, science and education had thrown around their employments, and in other circumstances would have disdained such menial offices, as they would deem them, and have crowded into more elevated and congenial pursuits.

Another desirable effect would follow. When commercial men in our large cities have acquired large fortunes, and are possessed of taste and fondness for display, they seek often to

gratify their inclinations in costly equipages, works of art, and magnificent architecture. There is no objection to such expenditure, when properly directed and bounded by reasonable limits. When men of great means divert a portion of their resources to the patronage of the arts of statuary and painting, and other products of genius and taste, they are devoting wealth to some of its noblest uses. They are counteracting the tendency which a close application to commercial occupations has to foster contracted and sordid propensities. They are imparting refinement and elevation to their own feelings, and contributing to diffuse through a community sufficiently devoted to the love of gain, a healthful and liberalizing influence. But the taste for fine arts and magnificent display may become excessive and misdirected.

If some men of wealth, who now expend a hundred thousand dollars on the erection and fitting up of a dwelling, would limit the outlay to fifty thousand, and reserve the remaining half to purchase some unproductive and waste land, whose tillage is too difficult and costly for persons of small means to undertake, on which to gratify their taste, and cover it with the beauty of a luxuriant and ornamental vegetation, they would contribute to the promotion of agricultural improvement, and at the same time indulge a taste as much nobler than that which they gratify now, as the beauties of nature transcend those of human device. Why is not a fine landscape as worthy an object of admiration as the painting which exhibits its imitation to the eye? And why has not the divine skill which exhibits its wonders in the exquisite structure of plants, and the ornaments with which it gilds the flowers of the field, and the rich forms and foliage with which it invests the trees, as high claims to the homage of taste, and the expenditure of resources, as the art which hews the rock into the resemblance of the human form, but can confer no life to utter its expression through the rigid features? To a person whose susceptibilities of gratification are directed by right principles, the process by which a sterile and uninviting surface is converted into a rich and waving field, which causes the wilderness to blossom, and turns the foul morass into a smooth and verdant lawn,

conveys as much pleasure as that which causes palaces to spring out of the rough stones of the quarry. There are those whose well directed sentiments lead them in this direction; and the land which they have subdued to tillage, and adorned with loveliness, whilst it has been a noble monument to their taste and magnificence, has excited emulation, diffused more correct and useful ideas, and has been a subject of study and improvement to surrounding admirers. Some opulent men, of extensive information and liberal views, have by their intelligent and advanced modes of cultivation, conferred immense benefit on a large region. The spot which they have selected as the subject of their operations, and upon which they have bestowed their successful skill, has been a school of instruction to a whole community. In proportion as farming assumes a higher rank and becomes invested with new attractions, such instances will be multiplied; and we shall see those splendid monuments of wealth and intelligence adorning the surface of the country.

Mr. Webster might have expended the funds which he has devoted to his farm of fifteen hundred acres, at Marshfield, to the erection of a splendid mansion in Boston. But the farm is a nobler monument to his republican and old Roman taste, than would be a palace in the metropolis, whose architecture should surpass all Grecian fame.

Lastly. As a necessary consequence, farming would become more productive and profitable, particularly in the older parts of the country.

I have alluded to the influence of slavery in this country, in producing a constant deterioration of the soil. But the land has become much exhausted in the free states also. If, as it is confidently asserted, a thousand millions of dollars are required to repair the effect of injudicious and wasting culture, and to restore the lands to their original fertility, it is high time that an improved system should be introduced. Be it remembered that this deterioration has arrived at its present point under the labors of *practical* farmers, so called: those men, of whom it has been said that they possess all the knowledge which is of any value to field culture. If the only valuable knowledge

which we possess on this subject, produces no better effects than these, then may we expect that the older regions of the country will cease to remunerate the cultivators; the rural districts of New England will become a wilderness, and be abandoned to perpetual sterility, and the plodding labor which has drawn out the fine gold from her bald hills, will be exchanged for a search after the dross of the California mountains. But the evil admits of a remedy. The downward process can be arrested and stopped at the point which it has reached. It is only for the community to awake to the nature and responsibilities of the crisis, and comprehend the right source of relief. It is only for the National and State Governments to extend, in suitable ways, their fostering and efficient care to this great interest of the country, and aid in bringing the lights of profound research to the guidance of agricultural labor; and the same science which directs the track of the mariner in remote seas, and almost communicates the power of thought to the ponderous and ingenious machinery that executes the labors of millions of human hands, which has brought the poles of the earth together by rapidity of motion, and transmits ideas on the wires of lightning along nerves of steel, will cause vegetation to spring from arid sand, and convert the wilderness into a fruitful field, and that field into the garden of the Lord.

Agricultural Economy and Agricultural Ethics.

[*Extract from an address by* J. S. C. Knowlton, Esq., *at the last Fair of the Worcester Agricultural Society.*]

It is a wide and prolific field; and we can do but little more than look over the lowest parts of the hedge that surrounds it, and dwell but for a moment on the more prominent points that present themselves above the common mass of facts and deductions with which it is filled; all of which, as it seems to me, merit and should receive from the farmer a thoughtful consideration. They are the elements that combine to make up the character of an intelligent, virtuous, independent yeomanry—the most effective combination of civil, social and

moral power the world knows; a power that existed in its full development in the great struggle of our country, when every farmer's family had within itself all the means of support, independent of commerce and manufactures, and every farmer's hearth-stone sent forth its contributions of men and of supplies to the invincible cohorts of armed yeomanry that won for us the title of the empire of freedom.

It is not for me, and there is no occasion, to speak disparagingly of other classes of citizens—of mechanics and manufacturers—of traders and professional men. They have their parts to sustain in the great drama of civilization. But when we look abroad over our country, and see more than seventy of every one hundred of its population, quietly devoting themselves to the peaceful art of agriculture, scarcely aspiring to any honors beyond what their avocations afford, and patiently submitting to every variety of fortune that befalls them, the conviction forces itself upon us, that, as a class, the yeomanry of our country is a giant unconscious of his strength. It is time for this giant to awake to a consciousness of his capabilities. It is time for him to break the lilliputian cords with which he has suffered circumstances to bind him; and cause his power to be felt in forming and directing public opinion upon all measures that involve the improvement, the progress, and the welfare of that great branch of the human race that, under one government, is rapidly spreading itself over most of what there is of this western continent within the limits of the northern temperate zone; whose great leading interest is, and will be, agriculture; and whose capabilities will be adequate to feed and to clothe a world.

The physical, the civil and social, the intellectual and moral power of the country, is in the hands of the yeomanry; and as a class they should be prepared to bear that power onward with a steady nerve and a lofty purpose. The realization of this beatitude of rural life involves several forms of improvement and of progress.

First: Physical Cultivation.

The organization of animal life in man is too delicate to admit of great strength. Consequently ingenuity has been suc-

cessfully tasked to invent or discover compensating substitutes for this physical inability. These labor-saving improvements take innumerable forms, and are found in all departments of human labor; upon the land—in the shop of the mechanic—in the mill of the manufacturer—and indeed wherever man and woman are required to work. In no part of the world are labor-saving facilities more essential than in our own New England. Compared with the generous soils of the middle and western states, ours yields its products grudgingly. It therefore becomes the New England farmer to have a better plough, a sharper hoe, and a keener scythe, than can elsewhere be found. And as he has the power to compel domestic animals to aid him in his labors, he should have the kindest horse, the most vigorous oxen, and the most generous cows; and treat them as his servants, and not as his slaves. Selecting, from the various breeds, the best that can be found, he should, by kind and generous management, make the farm a home for them as well as for himself.

In the erection of the farm buildings, it is good economy to adapt their location and arrangement to the various parts of the farm, so that there shall be no waste of strength and time in the carting of manures upon the land, in harvesting the crops, and in going to and returning from the labors of the field. The farmer who builds his house and barn upon a hill, at one corner of his lands, instead of some position that is central and easy of access, sacrifices to some caprice the strength, the energies, the time, that should be husbanded for some of the demands upon each that spring up without cessation.

But the subjects for physical cultivation that most deserve the farmer's attention, are himself, his family, and the persons in his employ. Their physical power is an essential part of his capital. It is active capital. The dollar may employ it; but it does what the dollar of itself cannot do; it sets the world in motion. The amount of this capital should therefore be carefully tallied by the farmer; its capabilities for service, judiciously surveyed; its exercise, cautiously guarded from abuse; and its continuity and power of endurance, secured, as far as may be, from the multifarious accidents that diminish its

quantity and impair its force. To do all this, requires some study of the organization and laws of animal life. It is necessary to know something of the human structure—of what it is capable, and the accidents it is liable to, in the several periods of its existence. Men, like the fruits of the earth, have their different seasons for coming to maturity; and such is the diversity of physical development, that some are competent to hard labor and vigorous exercise, much earlier than others. These are considerations that should be known, and never be disregarded. You have pride in a spirited and graceful young horse; and you say to your son:—"Be careful, and not force him beyond an easy and harmless speed." But do you treat your son with the same consideration? If he is growing up with a sanguine instead of a lymphatic temperament, you should remember to treat him with as much tenderness, at least, as you treat your horse, and apply the curb rather than the spur; for by forcing an ambition that needs to be restrained, you may impair his constitution, and incapacitate him for future labor, and consequently for future happiness. There is no keener misery than that which proceeds from physical inability for active life. The amount of service, therefore, which the farmer requires from his help, should ever be with him the object of a watchful supervision.

Health is an essential contingent of physical force; and its preservation more important than the guarding of treasures of gold; for if you lose your gold you can gain more, or you can do without it; but if you lose health, you lose not only your best treasure, but your ability to gain other treasures. The great requisites for health are pure air, pure water, wholesome diet, and regular habits of living. No class of the community has such control over these accidents of life as the yeomanry. Attention to them is an important branch of physical culture. The farm-house costs no more when erected upon a gentle elevation, where the pure breezes of heaven strike it on every side, than when built by a bog or in proximity with a slough. It should be thoroughly ventilated; and with an abundance of pure air and pure water, the farmer's house may be made his castle of health as well as of safety. But little occasion has he

for any expenditure for ornament. Indeed the chief ornament of a farmer's house consists in the absence of all ornament, and the prevalence of an unadorned simplicity. And yet by a little exertion his dwelling may be made attractive. Success is found in the simple rule of having "a place for everything, and everything in its place." A few trees, shrubs, and flowers, please the senses, and develop, while they gratify a taste for the beautiful in nature and in art. These, it is true, are the little incidents of life; but in connection with physical and social enjoyment, they are untold wealth.

But as Satan scaled the walls of Eden, and turned its bliss into woe, so may the paradise of the yeoman be converted into a pandemonium of wretchedness, by opening its gates to those evil habits of living that do violence to man's physical organization. It is a fact, philosophically established, that every infraction, by man, of the laws of his animal life, is followed by an inevitable retribution. A retribution it is, upon intemperance and its brotherhood of vices, that palsies the physical energies; prostrates the mental powers; quenches, as with the wave of oblivion, the moral sensibilities; dries up the fountains of social life; sweeps away, as a whirlwind, the accumulations of years of thrift; and blackens its pathway like a consuming fire.

The ox never dies of intemperance; why, then, should man? Animal life they have in common; the ox obeys the laws of his nature, and is safe; while man, gifted with higher faculties, perverts his nature, and sinks to a depth of degradation to which brutes never descend. His physical organization and life should therefore be man's continual study; and the instincts of nature, under the guidance of reason, should be his "cloud by day, and pillar of fire by night."

I proceed to the consideration of another branch of this subject.

Secondly: Intellectual Cultivation.

Time need not be wasted, in such an assembly as this, in speaking of the utility, importance, necessity even, of education in its largest and most liberal sense. It is felt and acknowledged by all men. Presumptuous may seem the sug-

gestion from me, that the great leading idea of education is capable of a development to which it has not yet attained; and that no class of our population has this idea more in its control than the yeomanry. Education, as now conducted, is too much upon the principle of accumulation. We dig for knowledge as we dig for gold—for the biggest possible pile of facts; and we throw the grains indiscriminately into our treasure-house, instead of working up what we gather, into coins that will serve us in any emergency. An apothegm of truth is the saying, that "Knowledge is power." But of what avail is power, unless it can be had at the precise moment, and in the precise mode in which it is wanted? The great purpose of education is not to crowd the mind with accumulations of facts in history, geography, the sciences, and the arts; but to develop, to bring out, to expand, to enlarge all the faculties. The true end and aim of all learning was forcibly presented by the poet Wordsworth, in one of the few public addresses which he could ever be induced to make. It was at the founding of a school in his neighborhood that he said:—

"I must direct your attention to a fundamental mistake, by which this age, so distinguished for its marvellous progress in arts and sciences, is unhappily characterized; a mistake manifested in the use of the word *education*, which is habitually confounded with *tuition*, or school instruction. This is, indeed, a very important part of education; but when it is taken for the whole, we are deceived and betrayed. Education, according to the derivation of the word, and in the only use of which it is strictly justifiable, comprehends all those processes and influences, come from whence they may, that conduce to the best development of the bodily powers, and of the moral, intellectual, and spiritual faculties, which the position of the individual admits of."

I would not, here or elsewhere, speak even the faintest word of disparagement of the tuition of the schools. It is useful, eminently so, in its way. But schools are but the machinery of education; books are but tools; and masters but overseers to point out their character, and direct their use. When the youth leaves the school or the college, he has but taken his

first step in the never-ending march of improvement. He has but begun to learn. It will not matter what may be his position in life, he will ever find something to learn, and a way to learn it. No class of people are more favorably situated than are the farmers, to make this self-improvement. The world of facts, in which they move, has capacity. It is filled with ideas. They may be found in fields and woods, on the hill-top and in the valley, in stones, and trees, and running brooks. Flowers and fruits, the starry sky and the viewless winds, animate and inanimate nature, are the farmer's untiring preachers of truth. With an eye and an ear for truth, the yeoman may be upon his farm like Adam in the garden. He may give a name to everything he sees; and not only name it, but learn its nature and properties so as to teach them to others. And this is education; an acquisition more precious than legacies of wealth. It makes every man his own philosopher. It gives him mental force and activity. He becomes an observing, a thinking man; and from the fountains of his thought there wells up a wisdom that, to his practical life, is worth more than books contain, or lecturers impart. Like the rock of Moses, when touched by an inquirer's wand, his mind opens, and knowledge and wisdom gush out. It is practical thought, never-ceasing observation; and with lightning speed it runs from causes to consequences, and sees the end from the beginning. Society, thus self-educated, ever acquiring and ever imparting knowledge, becomes one great Lancastrian school, in which all are teachers, all are learners.

There is still another branch of this subject which should receive a brief consideration.

Thirdly: Moral Cultivation.

That I may not trespass too far upon the more important departments of the exhibition, to which this day is devoted, I shall, in conclusion, glance at one only of the aspects of this form of improvement. It is that of right—the foundation of the moral sense—and its administration by Justice; which iconology has embodied in the form of a goddess, blind to all but the balance she holds in her hand.

We live in the midst of a rabble of wrongs. Yet it is un-

doubtedly true, that in no part of the world has the sentiment of right taken such deep root, and become so widely diffused, as among the masses of the people of this country. Especially is this true of the agricultural population of the great rural districts. How exposed to open trespass, and to petty aggressions, are all their rights! And yet how seldom are they invaded! And this in a country, whose government rests upon the popular will, indicates the existence, in the broad bosom of the population, of a sensitive and all pervading sense of right and of justice.

Our rights are of a two-fold character—of person and of property. The former hold, in their comprehensive embrace, life, liberty, and happiness; and, as republican citizens, these are the patrimony bequeathed to us, in equal measure, by a more than heroic age. Guarded well the legacy has been by the generations that have preceded us. Let these three great properties of humanity become the cynosure of every man, from the Atlantic to the Pacific, from the north to the farthest south, and there is hope that this heritage of freedom, of right, and of justice, will be consecrated to a duration as lasting as the pillars of time.

Property, in the catalogue of rights, has a secondary classification. And yet it is so mixed up and blended in with the rights of person as scarcely to admit of a difference that is anything more than an abstraction. Invasions of the rights of property are the prolific sources of the accumulations of wretchedness that meet the eye of the philanthropic at every turn. "Man's INJUSTICE to man" sustains the courts of law, and keeps running the machinery of justice. And the mass of litigation, that is seen on every side, not only mars the happiness of society, but imposes an immense tax upon the producing energies of the people for its support. Next, therefore, in importance, to a perpetual observance of the rights of person, and the amenities of life that should ever accompany that observance, a respect for the rights of property should be inculcated with the earliest lessons of childhood, that it may grow up with the man, and become so incorporated with his very being that he shall ever feel that an injury done to another, is an injury done to himself.

The farmers have an especial interest in this form of improvement. Their property is peculiarly exposed to aggressions. Land and products, trees and fruits, stock, yards, and buildings, are all open to depredations. Their security materially depends upon the prevalence of a sense of right in the great body of the people; and this sentiment should therefore be trained up to a quickness to perceive, and a forbearance to offend. Besides these bold invasions of the property of others that inflict substantial wrongs, there are thousands of petty aggressions, often the result of indiscretion and thoughtlessness, more than of malice or evil intention, that wound the possessor of property more deeply than bold infractions of right. The fruit upon a tree, and the flower or shrub in the yard, that may be reached and rudely torn off by the passer-by, may have a value in some idea, association, or memory of their rightful owner, which none but himself can appreciate, and whose loss cannot be compensated by any award that justice could make.

But there must be, among the whole people, a reciprocity of right, a mutuality of justice. Justice must be rendered as well as received. The laboring classes want justice more than charity;—the full measure of reward for their industry, promptly acknowledged, rather than an ostentatious charity that has been extorted, it may be, from their scanty and ill-paid earnings. The condition of the laborer needs such a modification as that, in time, he shall not be dependent upon wages; but shall himself become a proprietor. In this, as in other departments of national education and progress, the great agricultural class must take the lead. What they have the power to do, should be entered upon without delay. The past may be looked at, but cannot be touched; for time closes its massive doors close upon our footsteps. The present alone is ours. The future must perform what the past has failed to accomplish. The substantial yeomanry of the country must be the university, if I may so say, that is to train up a nation in knowledge, wisdom, and virtue. And just in proportion as this moral grandeur of a people progresses, shall we see advancing that golden age, that, in a sort of apocalyptic

vision, was disclosed to the poet, as a millenial condition of society, when

> " All crime shall cease, and ancient fraud shall fail;
> Returning justice lift aloft her scale;
> Peace o'er the world her olive wand extend;
> And white-robed innocence from heaven descend."

God speed the day! And man welcome it as a new heaven and a new earth!

The Advantages of Science in its Application to Agriculture.

[*Extract from an Address delivered at the last Fair of the Hampden County Agricultural Society, by* John P. Norton, *Professor of Agricultural Chemistry, Yale College.*]

There are probably few of those here present, who would be willing to assert that the agriculture of this county is just what it should be. I venture to say that if I were now to go about among this audience, and ask each one of you who is engaged in farming, if he considered this district cultivated in the best possible manner, there are few, if any, who could conscientiously answer in the affirmative. Here would be pointed out one wrong proceeding, there another, and I should be directed, if the inquiry were pushed still farther, to farms that are constantly running down, and perhaps to some fields that are so exhausted as to be scarcely worthy of cultivation. I should find too a great variety in the product of what is usually considered well cultivated land; even in the same township, where the original character of the soil was the same, we find farms whose productiveness is entirely different; one bears as good and perhaps better crops now than it ever did, while the other grows worse and worse every year. Is it not worth your while to ascertain the cause of these differences? Why is it that one of these fields, or farms, bears so much more than the other, and still seems susceptible of farther improvement? When will it reach the limit of improvement? When will it produce the heaviest crop that it is capable under any circum-

stances of producing? Do we know as yet how much of any one crop an acre of land can bear? We know that single acres have produced between 60 and 70 bushels of wheat, 140 or 150 bushels of Indian corn, 500 or 600 bushels of potatoes, 3 or 4 tons of hay; can we ever hope to accomplish anything like this with the majority of our acres? If we take the average crops over this State, we shall find that they do not amount to more than the fourth or fifth of the high numbers that I have mentioned; it becomes clear at once then, that the State does not, great though its aggregate product is, yield more than a third or fourth of what it might. This is a circumstance which demands serious consideration; it may not be possible, by any profitable outlay, to bring all of our cultivated land into such a condition as to bear these largest crops, but if we cannot quadruple at once, can we not, after a time, double our crops? This question I answer decidedly in the affirmative. In the county of Seneca, N. Y., according to the elaborate reports of Mr. Delafield, now President of the New York State Agricultural Society, the average wheat crop, some fifteen years since, was not more than from 10 to 12 bushels per acre. Last year, as he himself assured me, it averaged 25 bushels. There is no reason to suppose that the farmers who have brought about this change, will pause at 25 bushels—they will fix their mark still higher; indeed, I know that some of them are not now well satisfied by anything less than 30 bushels. And still in the face of this, there are other counties in the State where the wheat crop is decreasing from year to year, and where the farmers are beginning to give it up in despair as unprofitable.

Do not such facts as these that I have now brought before you, show very decidedly that there is something wrong in our farming? If they were mere assertions, resting upon my own authority, it would be a different matter, but they are nothing of the kind. You all know, and could, I doubt not, mention instances in your several towns, of farms side by side, entirely different in their productiveness; the one of which is going up, the other going down. You all know too that the same features of difference may be found in towns that adjoin each

other; the farmers of the one improving their lands, while those of the other are neglecting and injuring theirs. If any doubt that many of our counties are in the same relative position, you can assure yourself of the fact by consulting statistical and other returns. While you are about this work it may be well to go even farther, and compare ourselves with England and Scotland; such a comparison will make manifest the mortifying conclusion, that on their old land which has been cultivated for many centuries, the crops are far greater than on our new and virgin soil, where the stumps of the original forest have scarcely yet disappeared. I am then right in my conclusion that the state of our agriculture is not what it should be.

But we must not be satisfied with arriving at this result; let us inquire into the causes of it frankly, and without prejudices, and if we find that we have been wrong in our course of procedure, make up our minds to a manful confession. I have said that many of our farmers are more successful than their neighbors; their land, originally the same, is better; their crops are better; this superiority is not a matter of chance, or of luck; there is some cause for it. Let me illustrate by a short story, my ideas as to the nature of this cause. Some years ago I made two voyages between New York and Liverpool, with a certain captain, who was then, and still is, famous for his short passages. These passages became quite proverbial, so much so that his arrival in advance of every other vessel was considered almost a certainty. Some of the other captains said it was luck; others said that he was reckless; and nearly all united in the opinion that he would fail some day—would meet with some misfortune, and perhaps lose his vessel with all on board, in urging her beyond what prudence would warrant.

Having a natural fondness for the sea and for ships, I was at once much interested in his management, and finally became intimately acquainted with himself. Then it was that the whole secret of his short passages came out; he was ambitious to excel, and studied his ship, his chart, the winds and waves, as closely and constantly as ever a scholar studied his book.

He knew just what sail his ship would bear; he calculated and foretold from long observation every change of wind and weather, took advantage of every current, and finally was, while at sea, a perfect model of sleepless vigilance. Thus what some called *luck*, was the natural result of devoting his whole mind and every energy to his business. His luck still continues, although he no longer sails between New York and Liverpool. It was but a few days since, that I saw a notice of his having made the shortest passage on record, between New York and a well known Pacific port.

Thus I fully believe it ever is; if a captain always makes good passages, if a farmer almost uniformly has better crops than his neighbors, it is common for those who are beaten, to talk about luck, but in ninety-nine cases out of one hundred, luck has nothing to do with the matter; success is the reward of sagacity, sharpened by study and experience. As a nearly invariable rule, we shall find on inquiry, that the successful, thriving farmers, those who take the lead in their own districts, are not the men who rely entirely on their own knowledge, and consider themselves to have attained all that is worth knowing; but those who read, who study their business in every department, who seek information from every source. And what is quite as invariable in my experience, is the fact, that as a man reads more widely, and studies more closely the practical applications of knowledge, he becomes more modest and more convinced that he has still much to learn; more eager, too, in the pursuit of every new acquirement.

If we carry our comparisons still farther, we shall find that it is much the same with communities and districts as with individuals. Where the farming is best, where the crops are largest, where the stock is purest, where agricultural societies are best sustained, there we shall find most agricultural periodicals and books, and the most earnest desire for instruction. This is a fact which admits of no doubt, and of which any one can satisfy himself by inquiry and observation.

I think that the point which I have desired to place before you, is now coming out clearly. It is this—that our farming needs an application of *mind*. It is mind which has always

triumphed over matter, in the whole history of our race, and agriculture is no exception to the rule. Every year is making more manifest that the farmer needs to study for his profession, as much as the lawyer or physician; and that he who studies most, combining at the same time practice with his theory, will be most successful.

It is necessary here, however, to make an exception to those men who rely wholly on theory, and on books, and whose efforts at practice, unsuccessful for this reason, have disgusted many working farmers, and affixed to the title of *book-farmer* a stigma of contempt. Book-knowledge is extremely valuable in itself, but not by itself; combined with practice it can do wonders; separated from it, the results are those blunders of amateurs, which the old farmers laugh at with so much contempt.

Practice and theory must go together, and it is their close connection that I am advocating before you to-day. I do not come to say to these experienced farmers about me, that I could take their farms and carry on every department of work better than they—if I attempted this, the consequence would certainly be a failure, at least until the every-day practical experience of my younger days should be revived. But I do nothing of the kind; my business is to point out the connection of your practical views with science; to find where are the points on which science can aid you. The scientific man has it for his vocation to study the composition of the soil, of the plant, of the animal, of manures; to learn what are the links which bind them together, what are the laws of the changes and transformations which occur among them; every fact that he ascertains in his researches, is a direct benefit to the farmer, because it gives him increased power in the various departments of his business. How he thus obtains more power, may not seem quite clear to all of you; let me now therefore occupy a little time in noticing some cases, in which scientific knowledge can be clearly seen to be productive of advantage.

We will first turn our attention to soils. By means of chemical analysis, we can take any one of the bodies which we see around us, and separate it into its component parts; we

can say of how many substances it is made up, what are their properties, and how much there is of each. When we thus analyze soils chemically, we find a great variety in their composition, but are soon able to settle down upon some definite rules. Very fertile soils, when we collect them together from all parts of the world and analyze them, are found to have an extraordinary similarity in composition. There are some eleven or twelve substances that are always present; not by any means in the same proportion, but in at least appreciable quantities. We thus have a standard of fertility. If in pursuing our analyses, we come to a soil in which there is a scarcity of some two or three of these substances, we shall invariably find on inquiry, that such a soil needs occasional supplies of manure. If we come to another in which a number are absent, or greatly reduced in quantity, that soil will certainly prove barren.

Thus the farmer has a simple rule laid before him. If certain substances are present in a soil, that soil when properly cultivated will yield him heavy crops; if some of these substances are wanting, he must supply them, and if many of them are absent, he must consider whether he can profitably make up the deficiency. These substances must be in the soil because they are needed to form the plant; an analysis of the plant shows this fact, and makes the connection between the two at once apparent. The plant will not thrive upon one or two of the articles that it requires for food, it must have all; hence the necessity of them all in the soil. The absence of only *one*, is sometimes fatal to a crop. I remember a case in point as to the straw of oats. This straw, and indeed all of the straws, owe their stiffness and elasticity to the presence of a substance called silica, which usually abounds even in barren soils. In this case, however, the oats were grown upon a reclaimed bog; they always grew up stout and large, but invariably broke down as soon as the grain began to fill out and render the top heavy. An analysis showed, as compared with a strong healthy straw, a very striking deficiency of silica. For want of this, although everything else seemed to be present, the crop always failed, or was greatly injured.

The connection between the soil and the plant being thus made out so clearly, the question of fertility or barrenness becomes, as a general rule, very simple, and one which the chemist can determine with great certainty. The valuable practical conclusions which we are able in various ways to draw from this knowledge are exceedingly numerous and important.

In the first place we are able to supply deficiencies, and to remedy defects, much more readily than ever before. Let us suppose a farmer to have some land which is deficient in lime, one of the substances absolutely necessary in a fertile soil. He adds some common farm yard manure; this it is true contains all that is needful in the soil, and partly supplies its deficiencies, but in the present case there is a special defect, and in order to supply the soil properly, a large quantity of special manure should be added; now of the yard manure each ton will contain perhaps fifteen or twenty pounds of lime—to furnish half a ton of lime then, it would be necessary to add no less than fifty tons of yard manure to each acre. But it is not at all uncommon, to apply lime at the rate of several tons per acre; and this is no more than a proper quantity when entire deficiency exists. It is then quite plain that a heavy, and even an excessive addition of common manure, will not properly supply a special deficiency. Thus a knowledge of the composition of his soil, would save the farmer not only expense, but time and labor, and this to a very considerable extent.

Cases of this kind might be multiplied: it not unfrequently happens that three or four bushels per acre of sulphate of lime, that is, the common plaster of paris, produces more effect than tons of other manures, and will continue the land in a fertile condition for some years. This too is a case of special deficiency.

There is no more common want in our long cultivated soils, especially where much grain has been grown, than of a substance called phosphoric acid. You may not many of you know what this is, nor is it necessary for our purpose that you should; suffice it to say that it exists more largely than any other substance in the ash of grain, there being comparatively little in

the straw. Now the grain, as you all know, is generally sold off, while the straw is made into manure, and returned to the soil. A constant draft upon the phosphoric acid of the soil is thus kept up, and that body is therefore, in a great number of cases, the first to give out; as it fails, the grain crops begin to fail also, and this, although there may be quite an abundance of all save this single substance.

Much has been said of late years, and with justice, as to the remarkable effect of bones in bringing up the land where grain crops are cultivated. A few bushels of bone dust per acre, in some parts of Connecticut, have been found to produce as large crops of Indian corn, as the soil bore when it was first ploughed. This effect is owing to the fact, that bones contain a very large proportion of phosphoric acid; they supply therefore just the substance of which the soil has been more particularly exhausted in the course of cultivation.

For want of such knowledge as this, plain and simple as it appears when once explained, thousands upon thousands of tons of bones are annually thrown away or neglected. In some districts they are collected to go to Europe, for the British farmers well know their value; in other places, they are gathered to make glue, or bone black, but scarcely anywhere for the most valuable purpose of all, their application to the soil. The farmer sees his grain crops diminishing every year, and the ordinary dressing of manure no longer produces the effect that it formerly did; in order to get a heavy crop he has to use so much of it, as to take away a large share of his profits. If he knew that on such land, in nine cases out of ten, there is a special deficiency which can be supplied by the addition of eight or ten bushels of bone dust, he would be able to obtain large crops again, and at the same time could not fail to give credit to science, for the information which enabled him to produce such satisfactory results.

Every farmer, by taking a little trouble, can collect a considerable quantity of bones on his own premises. Bone mills, however, are scarce, and the best way is to dissolve them in common oil of vitriol, that is, sulphuric acid, and thus apply them in a state of fine division. Sulphuric acid is a cheap sub-

stance, and is of itself a good manure. You are not very far from one of the most valuable localities of mineral phosphate, on Lake Champlain. I have examined some of the mineral veins from which it comes, and consider it worth far more than a gold mine to the state of New York. The supply that it will afford is very large, and the mineral obtained when dissolved in sulphuric acid, as bones are, will form a most excellent manure; from one to two hundred pounds of this, will be sufficient for an acre, if applied in connection with about half the usual quantity of yard manure.

Manuring with a view of supplying particular defects, or, as it is called, special manuring, will, doubtless, gradually find favor here, as it has done in England and Scotland. It has, in many cases, produced truly remarkable effects, and has brought whole districts into a satisfactory state of fertility, that were before only cultivated with great difficulty and expense. As our knowledge of the true action of manure increases, we may expect to make still further advances in this department; but even from what I have said at present, it is easy to perceive that our knowledge as to the composition of the soil, and of the plant, becomes, in its relations to the application of manures, exceedingly valuable and practical. The above illustrations are not more remarkable than a hundred others that might be given. But I must endeavor to give you glimpses of one or two other points.

You have seen that some knowledge as to the nature and number of the substances in the soil, is highly desirable. But when by means of analyses we have attained full information in this respect, both as to the soil itself, and then as to its relations with the plant, and with fertilizing agents, we have even yet fulfilled but a small part of our duty in this department. The substances of which the soil is made up, are not simple, but compound, all united one with the other, forming what are called combinations; thus carbonic acid combines with lime, forming our common limestone,—it is easy to prove this. Now these combinations are constantly changing and interchanging. We are accustomed to look upon the soil as dead, and inert, as almost unchangeable, but we are greatly mistaken in this view.

There is no shower of rain, no change of temperature, or of season, that does not have some direct or indirect influence on the soil; it is a species of laboratory, where silently and invisibly, but constantly, transformations are going forward which prepare materials for the living and growing plant. The causes, and the nature, and the end of these changes, are all objects for careful and persevering study; they combine to affect the farmer's operations and his success.

Let us take the influence of water upon the soil, as an example, and show how much is to be learned under this single head. A shower of rain falls upon the surface of the earth, and sinks down till it comes to some impervious layer, or water level. If this impervious layer, or water level, be at a considerable distance below the surface, then the effect of the rain is beneficial; there is merely enough left in the upper layer of soil to moisten, but not to wet it; air can consequently also find access, and the whole mass, to a considerable depth, is warmed by the rays of the sun. All of these conditions are requisite, as they are necessary to cause fertility by the regular and progressive occurrence of those changes, which fit the soil to become a part of the plant. If the land is too dry, such changes will not occur, and even all that is already soluble cannot enter the roots; in a dry, parched soil then, the plant fails, because it has no means of conveying its food up from the earth. Thus far, the action of water seems to be always beneficial. I might go at length into remarks on its good effect in the forms of rain, dew, vapor, ice, and snow; but will at present only speak of the evil influence which it sometimes exerts. Suppose a soil in which the water, in place of sinking too deep, finds its level near the surface, or, as it does in some cases, immediately upon the surface; it now acts in a different way from that which I have described. In the first place, air, and secondly, warmth is excluded; the soil then must remain cold, and shut off from the influences of the atmosphere. Wherever this state of things exists, the formation of certain acid vegetable compounds commences, and if no steps are taken to remedy the evil, goes on until the whole track is converted into a bog. These vegetable compounds are black or deep brown, and are

well known to all who have ever seen much of swamp land. The material of which they are formed, contains all the elements of fertility, but in such a state that they are entirely locked up, for no valuable plant will grow upon them in their unaltered condition. Lay the swamp dry, however, or draw some of the earth out and mix in a compost heap, and it will in almost all cases support a luxuriant vegetation. The process of decomposition, arrested by the constant presence of too much water, goes forward again as soon as this is withdrawn, and the elements of fertility which are present, are thus enabled to exert their action on the plant.

Such is the state of things when the water level is at the surface; the evil action of the water is here perfectly obvious; but there are other cases where, in concealment, it does a scarcely less injurious work. If you remove the level at which water constantly stands, to six inches below the surface, the same consequences result that I have before described, as to the formation and accumulation of deleterious mineral and vegetable compounds. They do not appear on the surface, however, except perhaps in spring, and it appears quite dry. This dryness is not exactly what it should be, for the class of plants produced naturally on a soil in this condition are poor. If a pasture, or meadow, the grass is harsh and wiry, and ill adapted for food; if ploughed, the crops are scanty and uncertain. The land is called by farmers cold and sour; no doubt every farmer among my audience, can think of some such land, for I find it abundant in all parts of the country.

Now all of this land is thus rendered cold and sour by the presence of too much water; the terms exactly express its qualities; it is sour because of the abundance of certain vegetable acids, and it is cold because of the constant evaporation of water from its surface. Many practical men will disclaim indignantly, the idea that such a soil is really suffering from too much water, at least in such a degree as to render drainage necessary. It is true, they will acknowledge that it is rather wet, and therefore backward in spring, but it dries up very well later in the season, and even in some cases suffers from drought. The fact is, that this being wet in spring, is one of the chief

difficulties. The evaporation of water is its conversion into vapor; during this conversion, a certain amount of heat is absorbed from the atmosphere and surrounding objects. You all know that if you dip your finger into water, and hold it up, it will feel cool, and particularly on the side from which the wind blows; it is possible to tell the direction of the wind in this way, when all other means fail; the reason is, that where there is the most air, there is the most evaporation of the water, and consequently a greater withdrawal of heat from the fingers. If you take ether, or any fluid that evaporates much more readily than water, you may obtain quite a degree of cold, even in the hottest weather. It is, by means of some chemical substances that evaporate very fast, possible to freeze water in a red hot vessel. All that is necessary is to pour a substance that will evaporate almost instantaneously, into the dish, and immediately afterwards a little water, from which the heat is all so quickly withdrawn by the evaporation of the first liquid, that it instantly becomes a solid mass of ice, capable of being turned out and handled. This is a mere chemical trick, but it illustrates the great power of evaporation in producing cold.

How must it be then, in spring, with two adjoining fields, one of which is well dried, either artificially or naturally, and the other saturated with water, because its constant level is but a few inches beneath the surface. From the latter field a far greater evaporation is constantly going forward, than from the former, and it is consequently much colder; the bulb of a thermometer immersed in the soil of two such fields, will show a difference of temperature; a difference that must continue far into the season. The sun's rays then, instead of warming the earth, as they should do at this genial period of the year, are mostly expended in evaporating a surplus of water; the field is consequently backward and cold; grass grown upon it is thin, wiry, and sour; crops planted there come up straggling, yellow and sickly.

Thus much for the ill effects of this water in spring. It is not difficult to explain why this same land resists drought so poorly, although at first sight it seems a paradox that land, which suffers in the early part of the season from too much

water, should afterwards suffer equally under a prolonged period of dry weather. This is however undoubtedly the fact in many cases. The cause is this—as the surface dries with drought, the plants are obliged to push their roots downward in search of moisture, but in this case they cannot go far without coming in contact with the injurious acid substances, that are so apt to accumulate at and beneath the water level, especially when that level is near the surface where vegetable matter abounds; thus the plant forced to receive food into its roots, and finally into its circulation, that is injurious, and even noxious, begins to droop, and if the drought continues, dies. I have seen land of this sort ridged up quite high for grain crops; in a dry season it was curious to observe that on the tops of the ridges, where of course the soil was dryest, the crop was best, while in the hollows between, where was most ready access to moisture, the plants were yellow and small. On the top of the ridge they had a considerable depth from which to draw supplies before getting to the noxious subsoil, while in the hollows they were but a few inches removed from it.

This is a complete explanation of the observed fact, that well drained land generally withstands drought better than wet land; and it shows too that much of the land which is now considered by our farmers nearly dry enough, is really suffering from the presence of too much water. The introduction of drains would lower the water level to a point where vegetable matter does not often abound, and where hurtful compounds would therefore seldom form; the surface soil would at the same time be warmed by the sun, penetrated by the air, and rendered wholesome for plants to a considerable depth. In accordance with those principles, I have no hesitation in saying, that the uses of the drain are as yet but imperfectly appreciated in this country. It will be applied over a breadth of land of which our farmers at present have little conception, although in many districts the subject is now receiving a great and increasing degree of attention.

This topic of draining might be made to occupy your time for many hours. The mere sketch that I have given of the effect of water, opens up at once a great field of inquiry; if to

these effects we were to add those which it produces in the soil as a solid, when frozen into ice, or snow, or as a solvent dissolving and carrying away some substances, and often in turn depositing others, we enter another extensive line of investigation, without even then touching upon the fruitful and most important theme of its relations to plants, in their formation, growth, and modes of nutrition. I have I think already said enough to show, that even in this one department there is much already made out by scientific research that is extremely valuable to the practical farmer.

And yet this is but a mere commencement on the subject of the soil, for many points regarding it have not even been named or alluded to. But I think that my object has been attained if I have been able to show that there is something to be learned by scientific investigations, that is of direct practical value. I have made no statements to you that are merely theoretical, that may or may not be true—that are nothing more than probable speculations. I *know* them to be all true, and entirely susceptible of proof. In fact what is most to be desired is, that farmers would institute the most searching investigation into these matters, would set themselves sternly at work to ascertain if such stories as I have told you to-day, are mere inventions or not. If I can once see a man brought to this point, once see him resolved to use every means in his power to get at the truth, I feel sure of him: he will as certainly become more and more a scientific farmer, as the sun will rise to-morrow,—there is no help for him; the whole subject of the advantage in applying science to agriculture, becomes so self-evident under examination, becomes so exceedingly attractive as well as practical, that I have never yet known a case in which each accession of knowledge, has not served to increase the thirst for more.

What is it then that I am advocating before you here to-day? It is simply the application of the full powers of your minds to your own business. The time is passing away when a man can plod through life, ploughing and hoeing, sowing and reaping, feeding and breeding stock just as his fathers have done, without a thought of improving or of reasoning. There

is no other class of men in our land that do this at the present day. The merchants, the manufacturers, the mechanics, have every sense alive; they never stop to say, my father or my grandfather did so and so, and I guess it is good enough for me; they look at a machine, or a process, or a mode of doing business, and say, how can we improve upon this, how can we obtain a more thorough insight into its nature. This should be the spirit of the farmer; this is his spirit in some respects, I am thankful to say.

In implements, probably no nation has made greater improvements within a few years than our own. Our ploughs, and our reapers, are at this moment calling forth the admiration of the world in London. The energies of the mind have been elevated to their construction; the plough in its present most improved form is not the result of some happy blunder, but of real study; its best shape is found by the application of abstruse scientific principles; the line of its draft is in the most advantageous direction; every part is light and yet strong enough for the work it has to do. Economy of material, perfection of shape, and the greatest possible ease of draft, consistent with a due performance of its purposes, have been all attained by study and perseverance.

In the department of stock too, there has been an evident increase of real study within the past few years. The improvement of our stock, the introduction of the best foreign breeds, and the peculiar excellencies of each, have engaged a great degree of general attention, and farmers have discussed every point in relation to this subject with a real determination worthy of all praise. Everything has combined to show, that the agricultural mind has been fully awake on this subject; and what has been the result? Just such an improvement as might have been expected. We have now not merely individuals, but whole herds, and flocks, equal to the best stock of Europe, and our shows all bring out samples of pure blood in the various departments, which indicate the deep conviction that rests upon the mass of the community, as to the importance of attending to this matter.

Thus we have before our eyes in improved implements, and

improved stock, examples of what may be done by devoting the mind to any department of business; for it must be obvious to the most prejudiced, that these improvements are only due to an exertion of the mind. The farmer who stands highest among you for improved stock, did not go blindfold into the market and select the first animal upon which he happened to lay his hand; he studied the subject until he felt competent, and then made his selection.

In these two respects, according to my opinion, the farmers of this country stand far higher than in any other. Their implements and their stock are in some points better than their land, or their general principles of cultivation, or the general produce of their crops. We often see good stock, and good implements, where the land is running down, and the crops are poor. This state of things ought to be changed, but it can only be done by the same means that have brought about the other changes. When the farmer becomes convinced that a knowledge of the composition of his soil, of his crops, of the food which he feeds to his animals, and of the best methods of improvement in all these particulars, is necessary; and when he bends the energies of his mind to the acquirement of that knowledge, then and not till then, shall we see a decisive change in the general character of our agriculture.

No one I think can deny, that information upon the points to which I have adverted to-day would be highly valuable, but these are only selections, taken almost at random here and there from among the great number of subjects that should be familiar to every farmer. In a brief hour like this, all that I can aim at is to give you an idea that there are things embraced within the province of scientific agriculture that you ought to know, and that would be highly useful to you.

If I came here and told you, as has been intimated by some writers, that in the course of a few years farming would be reduced to a mere pastime; that by means of chemistry your crops would be quadrupled with no expense; that enough manure for an acre of land could be carried in my vest pocket; that agricultural schools would bring about all this, and make your boys chemists in six or eight weeks, then you would cer-

tainly be justified in hesitating in your belief of my words, and in looking upon me as either an untrustworthy enthusiast, or a designing impostor. There are men of both these classes in this country; men who are constantly injuring the cause which they claim to serve. But I have held out to you no extravagant expectations, have not uttered a word that is not capable of proof, have in short only urged you to the necessity of studying for yourselves. There are courses of instruction now within your reach, where, by means of lectures and books, you can obtain such a general knowledge of this subject, as will enable you to understand much that now seems dark; to apply many scientific principles in practice; and to read intelligently, accounts of valuable improvements by scientific means.

Why should the farmer be the only man in the world who is injured by studying his own business, and using every means in his power to get a better knowledge of it? Is it not obvious that information upon such points as I have so briefly sketched before you would be advantageous? Why then do we hear the cry against book farming raised, whenever a step in progress is proposed? It is unworthy of New England; it is unworthy of the Old Bay State, that state which has always been foremost in every educational movement. Cannot the farmers of Massachusetts bear instruction in the theoretical, as well as the practical part of their profession? We know that education and intelligence give power, for it is this general education and intelligence, so prevalent among you, that has made the name of Massachusetts known and honored over all the civilized world. I refuse then to believe, that you will be long affected by any objections of this class; it is in fact easy to see that year by year their force is lessening.

The farmer will no longer be compelled to find his mental employment in themes apart from his own profession, for in the various problems connected with the phenomena of vegetable and animal growth and nutrition, that occur in the every-day experience of his own fields, he will perceive attractions of a most novel and beautiful kind, sufficient to occupy all of his powers, and exercise his highest faculties.

I do not profess to say that you will ever be able to earn

your living without work. The tiller of the soil must always get his bread by the sweat of his brow; it is doubtless a wise ordinance of the Almighty, that all who gain their own livelihood must do it by labor and toil; if it is not of the body it is of the mind, and the latter involves far more inquietude and uncertainty, and ill health, than the former. The farmer has in his everyday toil the secret of health and strength, and if his profits are smaller they are surer, while his life is on the whole happier and longer. If now by the moderate exercise of his mind he can increase the rewards of his bodily labor, his general condition will be improved, and he will have that just union of mental and physical exertion which tends most decidedly to secure health, happiness and competence.

His gains are not so large as those of the merchant, or the manufacturer, but they are far more certain, for his bank cannot break, nor his factory burn. His reputation and his aims may not be so high as those of the lawyer, or the politician, but his sleep is sweet, and his conscience untroubled; he suffers no gnawings of disappointed ambition, nor feels the hollowness of that success which has been purchased by years of ceaseless anxiety and mental struggles, by a worn-out body, and a satiated, wearied soul.

His success comes direct from that Ruler of all things, who sends his rain and his sunshine in their season and succession, who has promised that seed time and harvest shall never fail. His life is spent among the genial influences of that season when his fields grow green with up-springing grass and grain, when the air is filled with singing birds, and the trees with fragrant blossoms; in the glowing radiance of summer, when the city pours forth its weary denizens to seek relief in the deep shade of his trees, and by the side of his clear streams;— in the softened skies of autumn, when the yellow harvest is waving in readiness for his garner, when the clear tinkle of the mower's scythe is heard, and when each tree bends heavily with its burden of ripening fruit; and in the calm retirement of winter, with his work well done, his barns well filled, his cattle in their stalls, his family and friends around the social fireside.

Is not this of itself a desirable life, and does it not become most exceedingly attractive, when the farmer possesses that knowledge which I have advocated before you? When he can look upon his soil as the great laboratory, in which his intelligent skill shall direct and control the preparations for the benefit of his plants; when he knows of what those plants should consist, and with what he must furnish them; and when he sees clearly their connection with the animal economy, so that he can intelligently direct every operation in feeding and fattening, his occupation assumes an engrossing interest, and with his pure air and bright green landscape around him, he need envy no other mortal being.

The Importance of Agriculture and the Means and Motives for its Promotion.

[*Extract from an Address, by* Hon. Marshall P. Wilder, *at the last Fair of the Hampshire Agricultural Society.*]

The importance of Agriculture appears from its paternal relation to other employments. It is the central wheel of the great industrial machine. Accelerate or retard its motion, and you change the action of all the rest. Agriculture is industry's eldest child, the primary element of social organization, and the foundation of property, order and civil institutions. Twice in the history of the world, has the human race consisted of a single family conducting all the arts of life, and depending exclusively upon this primeval pursuit for support. In every period, its praises have been celebrated both in poetry and song. Scripture also abounds in illustrations and scenes from pastoral life. The rewards of this art have blessed the past and its promises gild the future. It is the almoner of heaven's bounty, distributing to all with a liberal hand. How has it converted the noxious bog and barren waste into highly cultivated fields, and made the dreary wilderness to bud and blossom like the rose! How have its benign influences illumined the dark abodes of want and misery! Oft has it fed the hungry, clothed the naked, and caused the desolate heart to shout

for joy! How have its blessings clustered around the social fireside, making the domestic altar vocal with praise and thanksgiving!

Well did the muse of our lamented Fessenden sing:

"Hail Agriculture! Heaven ordained,
Of every art the source,
Which man has polished, life sustained,
Since time commenced his course.
Where waves thy wonder-working wand,
What splendid scenes disclose!
The blasted heath, the arid strand,
Out-bloom the gorgeous rose!"

Agriculture, as an art, relates to the successful cultivation of the soil, to such care of the field and herd, as will enable the husbandman to realize the largest and most perfect products with the least labor and expense. The science of agriculture treats of the rationale of these processes, and of the principles which govern practice. In different localities and climates, the art may vary, but science is the same *here* and *everywhere*, *to-day* and *forever*, *immutable* like its Wise Author. Art may mistake, and give a particular soil the crop which its constituents disqualify it to produce. But science never errs, for she understands the constituents of both, and therefore can decide upon the adaptation of one to the other.

The difference between them appears from the course that each would pursue in the examination of the soil.

Art regards its external appearance, and discovers its adaptation to a given crop, often by doubtful experiment, by traditionary knowledge, or by mere conjecture. Science adopts a different course. She takes a portion of that soil, and puts it in her crucible, and by analysis ascertains its constituents. She learns also the constituents of the desired crops and of manures, and by a comparison of these results decides at once upon their mutual adaptation, or what changes must be made to produce fertility.

Let us illustrate the importance of scientific knowledge to cultivation. A farmer in New Hampshire had heard of the value of peat as a manure. He applied a large quantity fresh

from its native bed to his arable land, in expectation of an abundant harvest; but to his great disappointment the crop was an entire failure. Why? It contained a large percentage of sulphate of iron (copperas), fatal to his crops. To this, chemistry would have applied lime as an antidote, and thus converted the sulphate of iron into the sulphate of lime, a deadly poison into a substance valuable to his soil and conducive to its fertility. Again, a sea captain, who understood Neptune's dominions rather better than those of Ceres, purchased a farm in Massachusetts. He determined henceforth to plough old ocean's wave no more, but that he would enjoy comfort and tranquillity in the evening of his life, in ploughing the soil. He had heard of the mistake of the New Hampshire farmer, and resolving to avoid it, rushed to the opposite extreme, and thought lime as a fertilizer must be valuable. Having four hundred loads of excellent barnyard manure, he determined to make his debut in farming by turning it to the highest practical account. He therefore purchased two hundred casks of lime, and mixed it with the manure. At first, his expectations were raised to the highest pitch. He beheld his manure heap smoking like a coal-pit. Judge then of his disappointment when his scientific neighbors informed him that he had ruined the whole. The lime had disengaged the ammonia, and nearly destroyed the fertilizing properties of the mass. The facts to which we have referred, may be extreme cases, but many of similar character have fallen under our observation, all teaching us the dependence of art on science, and the connection of these is nowhere more intimate than in agriculture.

We hear much said of the superior advantage of *practice* and *practical* knowledge. But we rejoice that the science of our day is eminently "*practical.*" Here lies the great superiority of modern chemistry over ancient alchemy. The former works for the farmer and facilitates the various processes of the useful arts; the latter occupied itself in the vain attempt to discover a universal elixir, and the philosopher's stone. Science will be to the farmer, what the safety lamp is to the miner, enabling him to explore the otherwise hidden treasures of mother earth, and to bring them up for the benefit of mankind; aye, as the pole-star to the mariner, a sure guide to the haven of hope.

It might naturally be expected, that an art of such paramount importance to society, an art coeval with the origin of the human race, transmitted through past generations, destined to descend through the long vista of future ages, and yielding support to the myriad millions of all time, would long ago have reached its culminating point, and have received whatever aid science and legislation could bestow. But how different is the fact. Progress has indeed been made, yet experience, hoary with age, is to be systematized, and the deductions of science are still to furnish uniform rules for successful practice.

How a result so desirable is to be secured, and agriculture made to occupy the position in the great family of arts, which the God of Nature assigned it, and what are the means to such an end, are our next objects of inquiry.

The chief of these is scientific education, an instrumentality powerful in its operation, certain in its results, and which should be accessible to all. The farmer needs something more than physical strength and practical skill. If he would elevate himself and his calling; if he would rank with the Cobbetts, Tulls, Loudons, Johnstons, Liebigs, Thaers, of Europe, or with our American Eliots, Pickerings, Lowells, Colmans, Phinneys, and other renowned agriculturists, he must be a man of large and varied learning; nor must he ever account his education finished, but be forever growing in experience and wisdom. Let us not be misunderstood; far be it from us to charge our intelligent and virtuous yeomanry with any deficiency in natural endowments. We have always affirmed, and desire here to repeat, the contrary. Our farmers are among our most benevolent and patriotic citizens, ardently devoted to our free institutions, reliable for the support of the same, and for the preservation of our American Union. They are the ballast of our national ship, keeping her upright and steady amidst the winds and waves which agitate the political ocean, and as conservators of the republic, they hold with unwavering hand the balance of political power. As a class, they have intelligence and talent; many of them possess genius which would improve and adorn any vocation or station in society. What they need, is a wise direction of their energies to their profession, and this it is the object of scientific education to furnish.

It is not the energy that wields the spade, guides the plane, or reefs the sail, that is capable of demonstrating or improving these arts. It is a higher power, the culture of the mind; and this in agriculture, as in every other pursuit, must ever go hand in hand with the culture of the soil. Such has been the relation of science to the progress of art, and such it will forever continue to be:

"Survey the globe, through every zone,
From Lima to Japan,
In lineaments of light 'tis shown
That CULTURE makes the man.
All that man has, had, hopes, can have,
Past, promis'd, or possess'd,
Are fruits which CULTURE gives or gave
At industry's behest."

The science of agriculture has been defined a knowledge of the principles which govern judicious cultivation; but in truth it is an aggregation of sciences. A youth may soon learn the construction of a steam engine, the principles of its action, to take it apart and put it together, and to direct its fearful energy with his puny arm. But if its mechanism is to be improved, and its utility increased, greater attainments, original and independent thought are requisite. So in agriculture, the farmer may soon learn sufficient of the natural sciences, to understand the common arts of cultivation, but their highest improvement requires a profound knowledge, not merely of one branch, but of many sciences, mutually related and reciprocally dependent.

In confirmation of this opinion, we cite a few facts of undoubted authority. We have been favored by a gentleman* of large attainments and celebrity in the various departments of science, with the results of the analysis of the soil of more than one hundred farms in the state of New Jersey. Some of these may not be uninteresting as felicitous illustrations of the advantages of science applied to agriculture. He analyzed the soil of a field for J. J. Scofield, Morristown, on which he de-

* Professor Mapes.

sired to raise ruta baga turnips. It was found deficient of the following constituents of that crop, phosphate of lime, potash, organic substances, including a slight quantity of animal or nitrogeneous matter. These being supplied, the result was fourteen hundred bushels to the acre, as per certificate to the Legislature. He also analyzed the soil of a field for Dr. John Woodhull, which he had appropriated to the growth of wheat, and from which he obtained on the preceding year less than fifteen bushels to the acre. After supplying the deficient constituents, he obtained the succeeding year fifty-seven bushels to the acre. Another instance was on the farm of Robert Rennie, certified to before the committee of the Legislature, showing the great advantage of subsoiling and thorough cultivation. It was discovered by chemical analysis, that the surface soil was deficient in constituents which abounded in the subsoil. He prescribed subsoiling and a thorough mixture of the upper and lower soils. Some gentlemen who came to witness the operation, went away in disgust at the great depth of the ploughing, but the success of the experiment at length changed their disgust to admiration. The preceding crops were fifteen bushels of corn and sixty bushels of potatoes to the acre; but the succeeding, one hundred and fifty bushels of *ears* of corn, and three hundred and fifty bushels of potatoes. Such facts have been obtained by other scientific men, both in America and Europe. They might be multiplied indefinitely. We have space for only one more.

A gentleman in Maryland, whose cornfield appeared to be in the last stages of consumption, yielding less than one bushel to the acre, applied to a distinguished chemist, who, upon an analysis of the soil, discovered that it contained sufficient lime, potash, magnesia, and organic matter duly mixed with alumina and sand. One requisite for fertility only was wanting. This was phosphoric acid, which was supplied at an expense of ten dollars per acre, and the result was a crop of twenty-nine bushels of wheat to the acre.

Thus science teaches the secret of successful farming, the multiplication of products, without the increasing expense of adding field to field; in other words, the importance of scien-

tific cultivation, the economy of labor and capital, of small farms, but of large crops and profits. The truth is, in New England, where labor is expensive, there are but two kinds of farming which will pay. One is, gathering the products which a kind Providence sends without cultivation; and the other, that which is guided by intelligence and science. No man can afford to cultivate a large farm poorly, nor to gather a small crop, when he might harvest a large one.

Science has already improved our agricultural productions, and will continue to improve them. How much she has done for the potato. Compare the original, small, black, and acrid, with our numerous fair, mealy, palatable varieties! How dissimilar in quality, flavor and size! Compare our luscious peaches with the original species, the almond, tough, dry, and bitter;—our magnificent apples with the sour crab;—our plum with the parent sloe! The Bartlett and the Seckel pear, the Green Gage plum, and the Baldwin apple were produced from accidental seed; but science teaches how to obtain new and rare varieties, by hybridization, or crossing the existing varieties. This art depends on the sexual character of plants, which was developed by Linnæus, one century ago, amidst that ridicule and scorn which so often attach to discoveries, inventions, and new theories in our day. Our farmers are familiar with facts which develop the principles on which this art depends. They are aware of the necessity of keeping their varieties of corn, squashes, grains, and fruits, separate, lest they should intermix and produce, not each after its kind, but other sorts, unlike the original, sometimes as speckled as Jacob's cattle. But science alone can teach them how to turn this law of nature to the highest practical account; and how by it to produce new and valuable varieties, adapted to their particular location and climate.

By a corresponding law in the animal kingdom, we already have ornithologists, who pretend to breed fowls to order, in respect to size, plumage, and other qualities; and also among our experienced stock breeders, some who profess to breed domestic animals with similar exactness. Infinite Wisdom has fixed these laws and given us faculties to comprehend them,

and they must be thoroughly understood before farming can be raised to its legitimate and rightful position. Witness an approximation towards this general result, in the improved breeds of our cattle, swine and horses, and in the endless number and variety of fruits and flowers, produced the last twenty-five years by artificial impregnation. Thus Mr. Knight, President of the London Horticultural Society, produced the Black Eagle and Elton cherry, the Dunmore pear, and other new and valuable fruits, perfectly suited to that latitude; and this process is as applicable to the production of new grasses, grains, and vegetables, as to animals, flowers and fruits. This principle also teaches the art of raising the most valuable seeds, to avoid the immense annual loss of labor and money, from the use of that which either never germinates, or if it does, produces an inferior crop. Age, which improves some seeds, destroys others; and the art, and importance of procuring the best, are but imperfectly understood by most of our practical cultivators. We have room but for a single fact. An association of scientific cultivators exists within our knowledge, whose object is to raise seed for each other. The cabbage seed which they raise for themselves, they sell for ten dollars a pound, but that which is raised without this care, is sold for one dollar a pound; hence the former which is really the cheaper, will not pay a profit, because its superior worth is not understood by our farmers.

We cannot refrain from another suggestion which we deem equally important to the art of cultivation. We refer to the necessity and the utility of a proper division, and individualization of labor. The importance of this in other pursuits is generally admitted. It is not less necessary for the farmer. Some have already practised upon this principle with the greatest advantage. It has relieved those fears which many entertained, lest the farms in the vicinity of our large commercial cities, would be ruined by railroads which have only changed the crops and arts of cultivation. They have induced the owners of those farms, to devote them to a single crop, or at most to a few products for which their soil was especially adapted, or which their proximity to the market rendered profitable. For

instance, look at Westborough, in this State, or many other towns in the vicinity of cities which formerly raised a great variety of crops, but which are now almost entirely devoted to the production of milk or vegetables. Other cultivators near the market have devoted their attention to the apple, the pear, the grape, the strawberry and other fruits, which they raise in great perfection, and with satisfactory profit; and from the exhibition of to-day, we see no reason why Hampshire county may not make the cultivation of fruit as profitable as any other branch of farming.

A gentleman of our acquaintance raises and sells annually in the market of one of our commercial cities, a large quantity of native grapes, at prices so satisfactory, as already to have induced in him a resolve to plant vineyards near all the principal cities of our country. The cultivation of foreign grapes is carried on extensively in the vicinity of Boston. One cultivator produces annually five thousand pounds; another four thousand, and the whole crop in that neighborhood is estimated at more than forty thousand pounds, or twenty tons. The fame of the domestic wine, manufactured from native grapes in the neighborhood of Cincinnati, is co-extensive with the land. From the Secretary of the American Wine Growers Association, Dr. Warder, we have been favored with the following information. There are about one thousand acres now devoted to the culture of the grape for wine within twenty miles of that city. The profits are estimated at one hundred dollars to one hundred and fifty dollars per acre in a series of ten years,—the present crop at fifty to seventy-five thousand dollars annually; and the prospective crop, at one hundred to two hundred thousand dollars per annum. The President of the Cincinnati Horticultural Society writes us, that the cultivation of the vine is no longer confined to that region; but is extending with rapidity up and down the Ohio, and in the interior, and is attracting the attention of their most enterprising and intelligent citizens; some in the hope that it will be the means of lessening intemperance, and in which hope I most sincerely concur.

A gentleman who makes the cultivation of the strawberry

his special business, raises on five-eighths of an acre, more than three thousand boxes. These he sold by contract for the season, at twenty-five cents per box, or about twelve hundred dollars per acre. Who has not heard of Mr. Pell's apples? He has an orchard of several thousand trees, consisting of two varieties, to which he has specially adapted his soil by scientific cultivation, most of which he ships to Liverpool, and receives in return a very large sum. These are not chimeras of the imagination but incontrovertible facts, selected from a multitude, all bearing concurrent testimony to the utility of a proper division of labor, and a wise appropriation of soils to the crops for which they are best adapted. In other words, they prove the utility and indispensable necessity of a scientific education of farmers, for all these arts of cultivation depend upon science, and of course progress in them must depend on scientific knowledge.

But time forbids us to multiply illustrations of the farmer's need of a professional education. Give him this, put into his hand the means of knowledge, and by an economy of time and mental energy, his course will be onward and upward, towards that proud eminence which he ever ought to occupy. Give him this, and our most enterprising young men will no longer forsake the home of their childhood to seek their fortune in the city, and in the end to be driven back like Lot by the fiery storm that oft infests the place, to the country, in poverty and disgrace. Give him this, and you turn the tide of emigration from the auriferous mines of California, to the more hopeful "diggins" of our native soil.

Agricultural Education.

[*Extract from an Address by the* Hon. Marshall P. Wilder, *at the last Fair of the Berkshire Agricultural Society.*]

The remark, that progress is the watchword of the age, is as true as it is common; many of the useful arts of life having advanced during the present century with a rapidity unparalleled in the history of the world.

What astonishing improvements have taken place in the manufacture of cloth, since the inventions of Arkwright and others!—in the art of printing and electro-magnetism, since the days of our Franklin!—in the application of steam, since the discoveries of Fitch and Fulton! To what vast regions of illimitable space, our solar system has been found to extend, since the discoveries of La Place and Newton, several new worlds having been added to the sisterhood of planets. And what splendid triumphs of art over nature, in almost every branch of natural history, have distinguished the age in which we live.

What has wrought these wonders? *Education*, or the application of science to the useful arts.

By these means, man seizes upon the elements of nature, and subordinates them to his will. Look for illustration to the benefits resulting to our own country from the application to these arts, of that invisible agent which already drives our cars over ten thousand miles of railroad, and when present contracts are completed, will compass ten thousand more,—which, despite wind and wave, storm and tide, propels the thousands of steamboats that plough our navigable waters, and which turns the machinery of the world. Its magic power gives new direction to energy and capital, brings distant places into proximity, and unites them together by bonds which no party animosity, no sectional prejudice, and no vandal barbarity shall ever sunder.

But why should not its fearful energies assist the farmer, as well as the manufacturer, the mechanic and the navigator? Why not? It already does aid him in the use of the implements of husbandry. Why should it not assist him in the manufacture of manures and in many of the arts of cultivation? especially in the decomposition of rocks, from which our soils are primarily formed, and the production from them of fertilizing matter. It is already beginning to do this, if we may credit the statement of Professor Tighlman, who, by the aid of water at a very high temperature, has decomposed feldspar, a common stone, and obtained sulphuric acid and the salts of potash.

And why should not chemistry yet convert the undeveloped ingredients of the mineral kingdom into rich elements of fertilization? Of this we have an illustration in a phosphorite recently discovered in New Jersey and New York, which by the action of sulphuric acid is transformed into one of the richest fertilizers known, and to obtain which the English have expended four hundred thousand pounds sterling in a year, not only sending their ships to our own and other shores, but have dug over the battle-field of Waterloo, and carried off the bones of slaughtered thousands.

We may be deemed visionary, but who can be surprised at any discovery or triumph of genius? Improvement succeeds improvement, and the invention of to-day supplants that of yesterday. No project is too bold for the enterprise of the present generation. Our railroads spread out their net-work, drawing in closer communion the members of the body politic, and binding, as with bands of iron, countries and states in firmer compact. The press throws off its impressions with the rapidity of thought; the fire-horse, impatient of restraint, stands ready to convey them to the remotest hamlet of the land; and the mystic wire, as if reproaching the sluggish power of steam, threads its way to encompass the globe, and to urge on with electric force the progress and improvement of the age.

Thus we see what science has accomplished for other arts. She has also made some valuable contributions to the art of agriculture, and needs only a wise direction of thought, enterprise and capital, to work out still greater results, and to raise this much neglected calling, not only to a par, but above all other pursuits.

But without detracting from the merit which so justly belongs to the pioneers in agricultural improvement, the fact is undeniable that this art has not progressed proportionally with the other great departments of human labor. In all other trades and professions, a thorough education is essential to correct practice; an apprenticeship must be served; but in farming, where it is *most* necessary, it has too often been omitted, or left to chance, or rather *mis*-chance.

There are established institutions for the education of men for the pulpit, the bar, the healing art, for engineering, manufacturing and the mechanic arts; but agriculture, on which depends our national prosperity, has too often been left, like a ship at sea, without rudder or compass. We have colleges to educate men for the learned professions, nearly four thousand common schools, but at present, not an institution for the professional education of our farmers' sons, who, with their worthy sires, constitute so large a proportion of the population of our Commonwealth, and upon whom is levied so large a share of the taxes for the support of other institutions.

What the farmer needs is, the scientific education which the mechanic, the manufacturer, and the artizan receives, to enable him to become master of his calling. He must understand the processes of the vegetable kingdom; by what agents they are conducted, by what laws regulated, and how the whole may be turned to the best account with the least labor and expense; and for this knowledge of his art, he must depend on the light of science.

The thrift, industry and intelligence of other classes, have been conspicuous for the last quarter of a century; yet the tillers of the soil, not a whit behind any other class in natural talent and virtue, great in everything which pertains to personal worth, are left to toil on without receiving their proper share of scientific aid, and as though the All-Wise, who has promised that seedtime and harvest shall not fail, had prescribed no laws for them to study, no rules to govern their practice, and as though the fulfilment of this promise did not depend upon compliance with his immutable laws; for if there are scientific principles, upon which successful cultivation is based, then no effort can be well directed unless it is founded on these principles.

There is no department of human industry, in which the aid of science is more absolutely necessary; but the impression has too frequently been, that farming is purely *mechanical*, requiring *muscular* rather than *mental* power to ensure success; and this opinion has so generally prevailed, that if a man attempted to educate himself for the duties and responsibilities of

a farmer, he has been invidiously styled a "*book farmer*," or "*a man of zeal, without knowledge.*"

But what *is* agricultural education? It is that system of training which teaches the application of science to the art of agriculture. But what is the *science* of agriculture? It relates to the principles of successful cultivation. For instance, it teaches that "all plants live and grow by eating,"—what their appropriate food is,—where it may be found,—in what quantity, and how it should be administered.

But how shall this be attained? By guessing? by protracted and doubtful experiments? or by the clear light of science, which can solve these problems at once? Science says to her chemist, tell me of what that plant is composed,—then analyze that soil, and tell me if the plant will flourish in it;—and, if it will not, tell me what ingredients are wanting for the healthy development of its functions—whether it is adapted to the growth of wheat, Indian corn, of the pear, the plum, or the apple. Tell me what ingredients the growth of these will abstract, and what kind and quantity of manure must be applied to restore the productive energies of the soil.

Now the analysis of the chemist may settle all these points as satisfactorily as the longest and best practical experience of the farmer, and by which knowledge he may ascertain the appropriate food for his crops and for his stock.

Education increases power; and this is as true in agriculture as in any other pursuit or profession; and reflection will convince any one that such is the necessity for science in this vocation, that a long life of study and experience would leave the most intelligent far short of perfection. In fact, there is no pursuit which requires more intelligence; first, because the principles on which it depends are more difficult to understand than almost any other; and secondly, because some of the sciences which develop these principles, and their application, are yet in their infancy.

The farmer should have a scientific knowledge of his soils, and their adaptation to the growth of his crops; the preparation and constituent parts of the fertilizers he applies; the influence of his crops on the soil, and if exhausting, how its reproductive

energies may be restored. He should also understand the laws of the various chemical changes which take place in manures and soils, and their influence on vegetation, from the germination of the seed, to the maturity of the crop; the nature and remedy of the diseases of animals and vegetables; the breeding and rearing of stock; the habits of insects, and how their ravages may be prevented. These are indispensable; but how is he to obtain this knowledge? They are but slowly and imperfectly learned by observation and experience; and we need schools in which they shall be taught.

But, whether this knowledge shall be acquired in a college, an academy, or a common school, we will not at present stop to inquire; that it is requisite to the highest success, no enlightened cultivator of the soil will deny; for although some men make good farmers without these acquisitions, yet who doubts that they would make far better with them.

Facts substantiate this reasoning. For instance, at present, the average yield of milk per day, *through the year*, from a stock of *common* cows, is not supposed to be more than four quarts. But by the application of science to the selection and improvement of the breed of our milch cows, this quantity has been in many instances doubled, without additional expense for keeping, a result which in a stock of fifteen cows would add a net profit to their owners, at ten cents per gallon, of more than five hundred dollars per year, of more than five millions of dollars annually to the productive capital of the State.

An old and experienced farmer of this Commonwealth gives it as the result of his experience, that cows yielding four quarts per day, will pay but little more than the expense of keeping; all above that is net profit. Hence he considers, that a cow which gives eight quarts per day, yields as large a net profit as four cows giving five quarts each per day, making no allowance for the difference of keeping; and hence the profit on such stock depends on the milk properties of the breed. But the *quality* of the milk of different cows varies as much as the *quantity*. A distinguished farmer of Massachusetts, who keeps sixteen cows, churned, separately, the cream on one gallon of milk from each. The quantity of butter varied from three to eight ounces.

Is it not then economically a question of great importance, whether such an improvement can be produced, particularly in this county, so celebrated for the raising of stock? Whether, by any system of breeding, we can improve our milch cows so that all shall be as valuable for dairy purposes, as the best we now possess? Doubtless we can, if any reliance is to be placed on the laws of animal physiology or the deductions of science. Guided by these to successful practice, it is already the boast of the pigeon fanciers of Europe, that they can breed out the last tip of black from the wing, and of the herdsman that he can breed stock to a pattern.

Who cannot appreciate the difference between the clean, smooth, small-boned, beautifully-formed, quiet, and easily-fatted Suffolk pig; and the long pike-nosed, roach-backed, porcupine grunter, continually eating and squealing, but, like Pharaoh's lean kine, never full? And why may not all the swine in the Commonwealth be of the former class? If they were, their worth would be increased twenty per cent, not to speak of the great saving of expense in fattening.

On these and other points we want a system of experiments directed by scientific knowledge. Are they not important to our farmers? But how shall this information be derived? At whose expense? By whose instruction? They who are to produce from mother earth the grain and grass, the beef and pork, and other products for the sustenance of our race, should of all men have the aid of government to provide for them the means of knowledge and success.

True, we have agricultural papers and periodicals, and they have wrought wonders in the dissemination of knowledge. Where there was only one ten years since, there are now a dozen, urged on in their noble cause by a generous rivalry and competition, and it is estimated that in New England alone, there are sent out, weekly, more than fifty thousand copies. These are cheering omens. Their rapid increase and extension evince the growing interest of the community in this department of literature. Where they were once ridiculed as chimerical and visionary, they are now hailed as the welcome messengers, and as the best friends of the farmer. Let then

no farmer deny his sons the advantage of at least one paper, which is either wholly or in part devoted to this subject.

Agricultural societies have also contributed largely to the progress and diffusion of agricultural information. By their exhibitions and reports and other instrumentalities, they have scattered broadcast the seeds of knowledge, and propelled on, the car of improvement.

But neither these, or any other agents, now in operation, are deemed sufficient for all that is desirable. We have materials, but they need system, and encouragement. Where shall the farmer look for this, but to the Commonwealth, whose right arm is significantly upheld in her insignia for the protection of all classes of her sons? We have no such agricultural schools as abound in other countries. It appears from the report of President Hitchcock, one of the agricultural commissioners of Massachusetts, that there are in Europe three hundred and fifty-two such institutions, many of which he visited, and all of which exert a powerful and salutary influence, by the diffusion of intelligence, and by the improvement of this time-honored art. In republican France, there are seventy-five under government patronage. To one of these she made appropriations in 1849 of half a million of dollars. Another has already graduated six hundred well-educated agriculturists, who immediately found honorable and lucrative situations at the head of their professions. Monarchical Russia has sixty-eight of these schools, some of which are of a high order, and superior to those in other lands. Ireland, down-trodden, poor and miserable, has sixty-three of various grades, many of them of recent origin, all striving for the resuscitation of her soil and for her restoration to pristine wealth and prowess. The result is certain; she is destined to rise; aye, is rising already; for in the neighborhood of these institutions, where sterility lately abounded, are now highly cultivated fields. One instance shall suffice. At the Glasnevin college, the scholars by request came in from the fields, and recited, in a manner that would have been creditable to any New England college, in those natural sciences upon which their practice depended, and their cultivation evinced their skill in the art.

And shall youthful America, the school of freemen, the home of enterprise, the birth-place of invention and genius, the land where every son is a king, and every daughter a queen, long behold these successful experiments and remain inactive?

The existence of such institutions is only a question of time. New York, Ohio, Pennsylvania, and other states, are deliberating on the best methods of action. Foreign schools may not be congenial to our soil; but they will serve as models; they will prove suggestive. If they have been successful *there*, they will prove more so *here*, where all enjoy the advantages of education, and where the institutions of our country and every circumstance favor their success.

We make no objection to what the Commonwealth has done for other institutions; but we would most respectfully ask, why it is, that her funds have been so liberally bestowed for educational and charitable purposes, and for internal improvements, when no appropriation, *not even one dollar*, has been granted for the professional education of the farmer?

Our common school fund amounts to nearly one million of dollars; but great as are the blessings which have flowed and will continue to flow from it, yet why should not a portion of the State income from this resource be appropriated for agricultural education. Let the thousands of our farmers weigh well the subject, and decide the question. We have said other states are deliberating on the best modes of action; and the sooner Massachusetts moves in the cause, the more will she save of the renown for which she is so justly celebrated in all that pertains to knowledge, philanthropy and virtue.

The Progress of Agriculture, and the Necessity for its further progress.

[*Extract from an Address by* George R. Russell, LL. D., *at the last Fair of the Norfolk Agricultural Society.*]

Although agriculture was the first regular occupation of the human race, and has, without interval or cessation, employed a large portion of it, giving the highest civilization in proportion

to its progress and perfection, and raising to power and opulence the people who most assiduously pursued it, yet it has not made that advance which might have been expected, even in those countries usually quoted as evidences of the most successful cultivation.

It has been customary to speak of China, as the most extraordinary instance of elaborate and economical culture; and it is so, to a certain extent. Nothing can surpass the indefatigable perseverance and industry of the Chinese husbandman. He omits nothing and he wastes nothing. He collects everything that can increase the productiveness of the soil, and applies it with the utmost care and attention. His crops are the only things seen on his land; a useless plant is a horror to him, and the growth of dock and pigweed, often mingled with our corn and potatoes, would put him into convulsions. His farm and his garden are one and the same thing. He considers agriculture and horticulture synonymous terms, it being as difficult for him as for us, to define where the one ends and the other begins. He tills his land as his father tilled it before him; he knows that certain applications produce certain results, and that is all he does know. He takes no farmer's periodical, to bother him with novel notions; has no new implement forced upon his notice; is ignorant of any other stock than the unwieldy animal that wallows before his wooden plough; belongs to no agricultural society; has never heard of a cattle-show; and his patience is not subjected to the ordeal of hearing an annual address.

Centuries ago, the same looking man could have been found, working on the same field, with the same clumsy utensils; and, in all probability, he will be found there ages hence, with unaltered garb, without change of accompaniment, and with precisely the same amount of skill and information.

There are sometimes impediments to making acquaintance with the minutiæ of Chinese husbandry. The foreign investigator is liable to interruptions, which entitle the inhabitants to more credit for conservatism than courtesy, they occasionally evincing a disposition to supply him with more specimens of the mineralogy of the country than he has leisure or inclina-

tion to examine. They have little partiality for the "white devil," whose presence drives the affrighted buffalo over the rice-fields, and the frantic women and children screaming through the villages.

Though high cultivation is peculiar to parts of China, there are extensive tracts yet unproductive. The agricultural resources of the land are not fully developed, and, it is supposed, might be made to sustain even her over-estimated population.

We look to England, France, Belgium, Italy, for that progress which is worthy of imitation. There is much to be learned from all of them, and the adaptation of crops to soils, regularity, order, and neatness, shame our more slovenly management. In some respects they seem to have attained perfection, and yet they are continually making advances. In Great Britain, especially, there has been, for the last two hundred years, an amazing improvement. There, the wealthy, intelligent, and influential, devote themselves to the earth; not for mere purposes of display, in the exhibition of their magnificent domains, but from a generous feeling for a pursuit which they both love and understand. Fondness for rural life is a strong characteristic of that country. It pervades all classes of society, is instilled into them from infancy by all the influences around them, is encouraged by the story books of childhood, and deepened into more intense devotion by the genius of romance and the inspiration of poetry. It may be traced to every region of the globe. Wherever the Briton plants himself, whether in the temperate zone, or under the burning sun of the distant East, he carries with him the taste which has clothed his native land with beauty. If climate will not conform to his wishes and give him the productions of his well-remembered home, he carves out a space from the forest or the jungle, domesticates the wild flower and trails the strange creeper of the wilderness about his new-made dwelling. Nor has his government been satisfied in patronizing the most useful of the arts within the limits of its own jurisdiction only. The early navigators, who, under its direction, first ploughed the waves of the Pacific, took with them the germs of a vegetation which covers the islands of that now frequented ocean,

and gives to the mariners of all nations renewed health and refreshment. Its expeditions have interchanged the productions of different climes, equalizing the fruits of the earth, and scattering variety and plenty. Even by the icebergs of the Northern pole, have its providence and watchfulness been extended. Wherever, in those scenes of desolation, a bare spot shows itself, for a brief space, amid the eternal snows, the reluctant sun warms into doubtful life the seeds which have been left by friendly hands, that succeeding wanderers may be cheered by these kindly tokens of sympathy.

Great as has been the progress of agriculture in England, it has not reached that point of culmination from which every movement is descending. There seems yet much to be done. A distinguished writer* of that country says, "the single alteration of substituting the kitchen garden husbandry of Flanders in our plains, and the terraced culture of Tuscany in our hills, for the present system of agricultural management, would at once double the produce of the British islands, and procure ample subsistence for twice the number of their present inhabitants." And another† states, that "at least three-fourths of the whole arable land in the country is under very indifferent culture."

What is said of England, equally applies to the other highly cultivated countries of Europe, it being conceded that there is no one whose productiveness might not be increased to the necessities of its population. Yet, worn-out civilization broods, despondingly, over the apparently exhausted elements of fertility, and covering the seas with the superabundance of the old world, extends an unbroken line of emigration towards the setting sun. It comes to spread itself over this new land of promise. It comes, with the antiquated usages of past generations, to renew, on a virgin soil, the hopes which have withered in ceaseless and unrequited labor. It comes to demand, from the reclaimed earth, food and raiment and shelter; to seek comfort, independence, protection; to trust to an unknown land for the peace and subsistence denied in the much-loved places of its nativity. It comes to clear the forest, drain the morass, open

* Alison's Principles of Population. † James Smith.

the dark, dank face of nature to the breath and light of heaven. It comes, with limbs accustomed to delve and burrow, to do the rough work of this young country—to build her cities—to construct her railroads and aqueducts—to level her hills, fill her valleys, tunnel her mountains, span her rivers. It comes to unfold the resources of this vast continent, to people its recesses with active life, and to disturb the silence of its solitudes with the hum of industry. It comes to carry out the designs of the Creator, a predestinated agent to work His will and take its allotted part in the great drama enacting on this new stage of human destiny. Let Europe, then, pour out her population upon us if she will. There is room for all. Room in the primeval forest, on the boundless prairie, on farm and in workshop. Room in the schoolhouse, where the children of ignorance may be qualified for the duties and objects of life, preparing for future usefulness by a process of regeneration that shall atone for the neglect and degradation of the past. Withhold not from others the privileges we possess. They come as our fathers came. Grudge them not a portion of this ample inheritance, which is for all the sons and daughters of God who need a home.

There are obstacles to excellence in Massachusetts agriculture, independent of any moral agency of the farmer, and against which he can only oppose discretion and continual watchfulness. Our climate barely allows sufficient space between seed time and harvest. Our northern winter lays his cold hand upon the earth, and it is locked in such deep sleep that the vernal sun can scarcely waken it. We bound from snow to scorching heat, having summer upon us while we are yet expecting spring. Work, in all its variety, is crowded into a period so limited, that one thing presses on another with discouraging rapidity. Our rough soil, though requiring to be coaxed by all the appliances our resources can muster, before it can be prevailed upon to start a potato or push up a blade of corn, yet manifests an amazing alacrity in producing weeds; as though that were its legitimate occupation and it took pride in doing it well. At last, when by perpetual entreaty and unremitted warfare, the right things grow, and the useless are re-

lieved from immediate duty, there "comes a frost, a killing frost," like a straggler from the rear guard of a retreating army, taking a last shot. Then arrive catterpillar, canker and cut-worm, bugs "too numerous to mention," every genus and species that can crawl or fly, amateurs of various tastes, but uniform appetite, hastening to appropriate whatever portion of the banquet may best suit each particular palate, as though the sole object of planting was to set a table for their special accommodation. As regards these numerous families of visitors, which appear yearly to increase, the only alternative left may be suggested by quoting the brief, but comprehensive and very intelligible address of a colonel to his regiment, when leading it into action, "there's the enemy; if you don't kill them, they'll kill you."

It is believed that these devastators augment in numbers as the birds diminish, and that it would be well to have patience with the latter in cherry time, and let them pick even more than their fair share, in consideration of the good service they render us. On the score of prudence, it may be questioned whether it is not equally economical to lose part of the fruit, as to endanger the whole tree by grafting lead into every limb. Hostility is declared against birds of such tameness and confidence that they build their nests on the boughs which overhang our houses, make their home in our gardens, and seem to claim from man companionship and protection. Persecution, which, directed against them, looks very much like civil war or family quarrel, does not destroy their trusting nature. They cannot be driven from human society, but return with the spring to the old familiar places, appealing to our kindness and forbearance. An agricultural writer,* to whom Massachusetts is much indebted, once intimated that a young child would not be quite safe with a man who could shoot these gentle creatures. He, doubtless, felt such an act to be a violation of the sacred duty of hospitality, a desecration of the hearth-stone which assimilated it to murder. There are beautiful superstitions all over the world, which most effectually protect certain birds. They are sometimes founded on utility, but more fre-

*The late Henry Colman.

quently on a generous feeling growing from accustomed association. They are more powerful than law, for they enlist the sympathy of all, and create a rule of government which is too popular to be broken. Would that our household friends had such a shield; relying for security, not on the statutes, but the clemency of men.

However far we may fall below excellence in our farming, we have certainly reason to congratulate ourselves on the advance that has been made. Besides the more solid advantages, such as adaptation of manures to soils, rotation of suitable crops, draining and reclaiming land, which turn impassable swamps, covered with bushes, into ornamental and fruitful fields, there has been that attention to outward appearance which indicates taste, system, order, and an appreciation of the beautiful, which is a valuable auxiliary to well-regulated judgment. There is an improvement in rural architecture; a care for the comfort of animals, some solicitude about planting trees and repairing fences, and a laudable desire to do well and look well has become general. We have found out that it is as easy and as economical, to erect a habitation with some pretension to elegance, as to disfigure the side of the highway with a pine box, an ugly clump of clapboards and shingles. We begin to think it is not profitable, or becoming, to allow the worm to spin his web in our apple trees, till the orchard looks like the ruins of a wasting conflagration. The practice is growing less frequent of suffering our cattle to carry about them a proportion of the barn-yard, solidly caken on for a winter over-coat, while, in regard to such remnant of the hide as is visible, a course of exposure and low diet, like the tale that Hamlet's father could have told, causes "each particular hair to stand on end." It has also been discovered, that however appropriate the fur of the beaver may be for the head, it has a marked incongruity when protruding through a broken window. This peculiarity to our landscape, might once have elicited some expression of surprise at the unusual number of hatters' shops, were it not corrected by the conviction, that no sane mechanic would ever exhibit such specimens of his handicraft. On the whole, we have arrived at the rather reasonable conclusion—that trees,

like other things, require some attention after being planted,—that cleanliness is about as essential to animals as good food,—and that the fashion of glazing with old hats, goes out with the rum bottle.

The advance of our cultivation is often retarded by the indifference of the cultivator. There are to be found those who scoff at book-farming as useless, maintain that there can be no improvement in the management of the soil, and look at a newly invented implement as an insult to their ancestors. They would go on as the latter have done, not reflecting, that if successive generations did not add something to the stock of knowledge, we might get back to that patriarchal period when the broadest branched tree was the best house, and red paint the most fashionable garment; when the economy of the kitchen consisted in robbing the hoard of the squirrel, and the ten fingers were the only tools that scratched the face of mother earth.

A blind reverence for the past, is the great stumbling block of the present, and flagrant injustice to the future. Do as our fathers did! It is well we should, when we can do no better; but man has been made a progressive creature, is endowed with aspirations after excellence, has implanted in him a restless energy that is continually urging him onward. He could not stop if he would. He partakes of that law of motion which governs all things, from the smallest particle of animated dust, up to the infinite worlds, which, cluster on cluster, system within system, whirl in endless revolution round the throne of God.

The fanatic, who threw a stone at the Earl of Rosse's telescope, because it pried into mysteries, intended, as he believed, to be concealed from human curiosity, was a type of that conservatism which would have no new farming. It would not encourage the undutiful longings of children, who strive to know more than their parents. It would level the schoolhouse, entertaining Jack Cade's opinion of men, "that usually talk of a noun and a verb and such abominable words." Of what use is education, but to engender self-conceit and encourage wasteful expenditure? Why buy volume on volume,

and cover blackboards with cabalistic characters, when "our forefathers had no other books but the score and the tally?"

Advancement is the destiny of man. He who stops in the race is run over, and left behind, crippled and forgotten. Whatever may be the limit to human attainment, it has not yet been discovered. We press forward to an eminence from which we hope to behold all created things, but it is reached only to find heights to be climbed and difficulties to be surmounted.

While learning has rarely called in vain for assistance, when its object has been to swell the already overcrowded ranks of what is generally understood by professional life, there has been little or nothing done to educate young men as farmers. The most important and the most honorable occupation, which is coextensive with civilization, which employs millions of men in daily labor, and on which the whole population of the globe depends for subsistence, has not a single institution devoted to it in all this broad land. It is left to help itself as it can, without government protection, and with only such encouragement as can be derived from societies formed by farmers themselves. The exertions which have been made to establish an agricultural school in this State, have not yet been successful, but it is to be hoped that they will be renewed and persisted in, until this great branch of industry shall receive the care and attention it demands. It is not supposed that an institution will turn out ready-made practical husbandmen to order, from the mere learning of books. There is no such intention or expectation. But it is believed that a course can be followed, which will combine theory with practice, and produce young men of intelligence and activity, whose hard hands and bronzed faces will bear honorable testimony that they have seen as much of the field as the study-room.

It was a saying of Napoleon, that "battles make soldiers." It is equally true, that hard work makes farmers. He who would "thrive by the plough," must leave his gloves with his Sunday coat. He must not expect to walk daintily over the earth, in holiday garb, and have her productions spring up in his footsteps. He who courts her favors, must go manfully to

the work. She is not to be trifled with, and does not yield to coy wooing. The badges of her successful suitors are the dust of the ploughed ground, the sweat of the hay-field, the marks of honest industry wrought out in shirt sleeves. She loves the pressure of the cowhide boot, smiles on the tanned countenance, and the sinewy limbs, on which the insignia of manhood have been ingrained by the elements. But she does not look less winningly, if the calculating head, which guides the laboring hand, has drawn information from recorded wisdom, gathered hints from the periodical, interchanged opinions with fellow workers, and brought thought to bear on the great mystery of nature. Excellence in agriculture is neither the result of closet study nor of assiduous labor. It can be effected only by a union of both. May the sagacity of government consult the best interests of this people, by establishing the means of producing that as yet unknown prodigy, a perfect farmer.

The Mechanical Properties of the Soil, and the Consolidation and Protection of Manures.

[*Extract from an address by* James E. Teschemacher, Esq., *at the last Fair of the Plymouth County Agricultural Society.*]

In selecting a farm for cultivation, an intelligent man would begin by attentively examining the levels of the land, for the purpose of ascertaining how its various parts might be drained if requisite; for where water rests on the surface or a few inches under, or where it washes down in gullies, all good farming is useless; and also which portion would receive the most permanent part of the manure he would spread on. For it is very possible that a necessity would arise to put fifty per cent. more manure on one part than on another, to raise crops of the same value. The farmer who manures all kinds of land and all parts of a farm with equal quantities of the same manure, would make serious mistakes, and the economy of manures if pursued with judgment is of vast importance. His next step should be if possible to ascertain by sinking pits of various depths or otherwise, the nature and character of his

subsoils, the depth and qualities of his surface soils. On this last I shall dwell at some length, as it is a point of chief importance in a farm. This examination of course includes that of the extent and probable solid contents of his peat bogs, or any other isolated deposits either of sand or clay, and of the quantity of decomposed vegetable matter in his wood land from the annual decay of leaves, &c.

Now by this examination of soils I do not mean a chemical analysis, although if properly made this would be very useful, but a close inspection of the mechanical capacities of the soil, and chiefly of those most important ones of absorbing and retaining the most valuable parts of the manure with which it is annually dressed, for on the knowledge of this quality will depend much of the success of any system of farming adopted. We plough manure into the land, down come floods of rain by which the most valuable parts thereof are rendered liquid, and it is only in this liquid, dissolved and moist state that they can enter into the structure of plants. It is therefore absolutely of the greatest consequence, if the crops are to be fed and nourished in a time when rain is scarce, that there should be some substance in the soil, capable of absorbing and retaining these valuable liquids in store, and of preventing them from being washed and drained or evaporated away. I believe I need not insist on this view, before gentlemen in this section of the country, where the soil generally is so light and stony. But the consideration and thorough understanding of the mechanical properties of all soils, from the pure sand, which allows every liquid to filter through unaltered, to the stiff clay, which allows no liquid at all to pass through, are of the greatest consequence to the farmer.

Fill three filter jars, (common green bottles without a bottom, reversed, will answer, first placing a piece of thin cloth over the hole of the neck,) within an inch of the top with soils containing first about one-sixth pulverized clay, and five-sixths clean sand, well mixed; second, about one-third charcoal and two-thirds clean sand, also well mixed; third, all clean sand; then fill up all three with drainings from the dung heap. The liquor through the pure sand will come out nearly as it went

in; the other two will have left much of their color and nearly all the smell with the clay and the charcoal which have absorbed them. Experiments have been made showing that soils containing even moderate portions of clay, mixed with thin sand, would absorb all the alkalies and their salts which are put on as manure, and that this absorbent power resides entirely in the clay. Professor Way, of England, affirms that clay will even decompose the salts of ammonia, potash and soda, so that the plant may use them as wanted; so far, however, my experience does not go. The absorbent powers of charcoal are thus shown to be also great and of immense importance in absorbing and retaining the vast quantity of ammonia which comes down in the annual snow and rain, as well as what is put on the ground as manure—and as an absorbent in the compost heap it is invaluable. It is not at all improbable also that it undergoes in the soil an extremely slow natural combustion, furnishing thereby carbonic acid to dissolve many inorganic substances insoluble without its acid. But this, like a thousand other momentous questions in agriculture, will only be truly tested when a more general liberal education throws open the door of investigation to thousands of young and inquiring minds.

It appears from this and many other practical experiments that there are two substances which possess in a high degree this important power of absorbing and retaining for the use of vegetation, the most valuable portions of manure, charcoal and clay.

Now charcoal, in an agricultural sense, means not only wood charcoal but carbonized animal or vegetable fibre of any kind; it forms therefore the chief mass of peat muck, of leaf mould, of the manures of animals, which has been carbonized by undergoing gradual and slow close combustion in a dung heap, by the action of the oxygen of the atmosphere, just as wood or animal matter (bones) is artificially burnt into charcoal by a more rapid close combustion with fuel. The extraordinary powers of absorption and retention of the valuable salts of manure of both kinds of charcoal are the same—but all kinds, except artificial wood charcoal, are generally found mingled with

other substances. Peat muck, for instance, is usually accompanied by acids injurious to vegetation, either ready formed, or by substances which, on exposure to the external influences of the air, form these acids,—this renders sweetening or neutralization of these acids necessary previous to using it.

The manures of various animals are also mixed with phosphates and other salts, often of ammonia, which are very beneficial to vegetation, but the chief mass is vegetable fibre, which by proper management becomes this powerfully absorbent charcoal. I wish much to impress very strongly on your attention this character of absorption by charcoal, as it is the chief groundwork of the subject of this address.

The other absorbent of the valuable portions of manure is clay. This I shall not undertake to describe to those who know so well what it is, but will state, that its powers of absorbing and retaining the important alkalies, potash, soda, ammonia, and the salts of these alkalies, exceed those of charcoal. As a large proportion of the clay of this globe existed originally in the shape of feldspar, a constituent of granite and other rocks from which it has been separated by natural grinding down and disintegration, and then becoming a portion of other rocks, it of course formerly entered into the composition of many soils. From the more coarse, sandy and stony of these, it has been washed away in the lapse of ages; still many of them have a considerable proportion left, and in the trials made to ascertain the absorbing and retaining power of a soil, the amount of this power observed will probably be more due to the clay remaining therein than to any natural charcoal, which is not often found in sandy or loamy soils, but which is a large ingredient of the rich bottom lands and prairies of the fertile west, they being chiefly formed of decomposed animal and vegetable matter. The finest and most productive loams, the marls which in some places are used for manure with good effect, when there is not too much lime in them, are valuable on account of the absorbent power of the clay and of the salts of potash and soda then in its grasp. In the estimation of the value of land, then, the quantity of clay, if appreciable, forms a most important item. Three or

four per cent. of clay in a soil renders it extremely productive, and thus, where the depth of usual cultivation can be taken at eight inches, a covering of this absorbing clay on the surface, spread only one quarter of an inch thick and ploughed in, would be an essential permanent improvement, more so indeed than an equal amount of usual barnyard manure.

This absorbing and retaining power of clay has quite recently been published in England as a new and very important discovery in agriculture, and there is every reason to believe that just credit belongs to the claimant there; but it is equally certain that the same discovery was made here, after several years' investigation, and published in Massachusetts some months previous to the publication in England, and without the slightest knowledge of what was passing there. But the beneficial character of clay has long been known to the intelligent farmer and horticulturist, although unacquainted with scientific reasons for it, and even the precise mode of its absorbing action is yet confessedly beyond the reach of science itself. I have studied the subject a little and think that this absorbing action is partly mechanical, dependent on the power of contraction which is eminently possessed by clay (alumina) and which power it begins to exert almost immediately after its chemical separation from a solution, and still exerts under the most powerful heat of the furnace. By this it absorbs and grasps any substance with which it may be in contact; its mode of action, however, is a question still in doubt, and requires careful scientific investigation; this it will no doubt receive at the hands of those professors of agriculture who have charge of these subjects in European countries, and I can only express my regret that we have no institutions here where subjects of like importance can be studied and investigated for the benefit of the largest and really the most valuable class of our community, but we must be content to leave them to other countries.

Having endeavored to explain the inestimable value of charcoal and clay, in consequence of their powers of absorption, it remains for me to show, that although clay cannot be manufactured and may be too expensive to be hauled as a manure

from any great distance, yet that charcoal is entirely within the reach of every industrious and intelligent farmer, and can easily be manufactured by him in such quantity and of such quality as will enable him to render the poorest soil as permanently and luxuriantly productive as the richest.

To this subject I shall therefore devote the chief part of the time which remains, and I have chosen it as one of the greatest interest, and as practically applicable to the farms of this sandy and stony county.

There is but one way of permanently enriching this soil and putting it into such good heart as to enable it to afford constant remunerating crops; and this is, to use artificial manure for several consecutive years, and carefully to accumulate, manage, and preserve all the manure and refuse that can be collected on the farm during this period, and when this is properly manufactured into a rich charcoaly mass, saturated with all the valuable salts, to apply it in such quantity that it shall form a permanent absorbing mass with the soil, which cannot be blown or frittered away, or washed out or rendered useless by the hot sun for years. As on the mode of carrying this operation properly into effect depends its entire success, I must detain you a short time for the purpose of entering into its practical working details and calculations; but I wish first to make two broad assertions. One is, that any soil which is soil, that is to say, which is not entirely sand, entirely clay, or entirely stones, can be made to produce constantly and economically fine crops of vegetation of almost any kind that the climate will allow.

The other assertion is, that the exhaustion of well-tilled soil by crops alone, is a complete fallacy; it may be exhausted by putting on lime or other injurious substances, but not by cropping if properly worked. The various soils of England have produced wheat for many centuries, and they are now less exhausted than ever, for the average produce per acre has risen successively from 15 to 22 bushels, and within the last seven years, from which period we may date the great improvements in agriculture, it has reached the high figure of 32 bushels to the acre, but 40 to 50 bushels is a common yield. More than

this, the price has fallen from 70*s.* sterling per quarter of eight bushels, to 45*s.*, and yet it must be very profitable to raise wheat, as the land there has to pay high rents and taxes out of this produce, charges from which we here are happily free. Let us then hear no more of the idle story of exhausted lands or of soils unable to bear crops of wheat or of any other vegetation. *We* are deficient, not the soil, and if we are unable to make the earth fruitful for want of knowledge, let us at least take care that our children shall not want it; let us establish institutions where a sound agricultural education can be obtained. With our increasing population we may ere long absolutely want here all we can raise, especially if the western lands are cultivated for many years longer in the reckless way they now are.

But to our question. The scheme I propose to lay before you, as I have said, is that the farmer shall properly store up all the manure he can raise on his farm for several years, converting it into this charcoal, with the addition of all the inorganic salts requisite, and that when applied, it may be in such quantity that it shall form a permanent soil and be a kind of sponge, lasting forever to absorb for the use of vegetation the rich juices of the manure annually put on afterwards, which juices are now, on light lands especially, either washed through, out of the reach of the roots, or evaporated away by the hot sun.

It will be necessary, however, for me to enter into the values of the various substances the farmer must use in his heap, how this must be stored, and in what way managed, composted and carbonized, and how he must work to obtain remunerating crops while this is going on. I fear this plan may appear to many of you as absurd, but you should hear before you come to this conclusion, for I am only recommending to you what nature herself teaches in the plainest terms.

What, I ask, are, or rather were, the fertile lands of the west, or those of the rich valleys in New York, but heaps of vegetable matter converted into a black carbonaceous or charcoal soil, by slow natural combustion, accumulating and becoming consolidated, untouched by the plough for centuries?

There it has annually absorbed the ammoniacal matter from the rain and snow for ages, and all its good qualities have been condensed into the charcoal. Here is a specimen of this soil presented to me by Dr. Lyman Bartlett, of New Bedford, from his brother's farm in northern Illinois. No one can fail to observe that it is a black charcoaly mass, and rich crops are raised annually from it, yet it is found to be much improved by barnyard manure, because it is like an excellent sponge, absorbing all the rich juices thereof. On close examination, I find it rather deficient in the phosphates, and ammonia, which it obtains from barnyard manure; a very little more lime in the shape of plaster would also be beneficial. [This specimen was obtained by pushing this tube down into the soil, and is therefore a true sample.] It will be seen that a bed of clay underlies the black mass, and under the clay, a bed of gravel composed of stones like this sample. These are masses of quartz (silica) and of a siliceous limestone. This soil has therefore been formed by decomposing vegetable matter probably in a pulpy liquid state, and is held in large basins of clay, through which knolls or hillocks of the gravel stones rise up, often appearing above the black soil in little clumps; these have formed natural drains for the water. These clay basins often extend fifty to sixty miles or more in diameter. It is very possible that a careful examination of these charcoaly deposits may throw light on the formation of the immense beds of coal in this country, under each of which there is a bed of clay, and below the whole formation a hard conglomerate rock with just such pebbles, indurated by enormous pressure for long periods.

Such accumulations of black vegetable matter in New England are much smaller and are usually formed in basins of the granite rock; although of smaller extent they are of very frequent occurrence, are what are termed our peat bogs, but being formed of different vegetable matter, are by no means so valuable are those in the West.

It is precisely such a black carbonaceous mass as this, only much more thoroughly saturated with ammonia, the phosphates, and all the other valuable ingredients of manure that

should be manufactured, that I will endeavor to show you how to manufacture, as well as my knowledge will enable me, and which it is recommended you should apply in large quantities at a time, in hopes permanently to enrich your sandy soil. It is equally beneficial on other soils, and enables it to absorb and hold the beneficial juices of the manure of future years, which are necessary for the support of a constant luxuriant vegetation. Some here may have seen districts where there are five to ten inches of black surface soil resting on many feet depth of gravel, sand, clay or rock, and these few inches are all there is to depend on for raising annual crops. I have seen large districts in Europe where the solid chalk was covered by six or eight inches of yellow or black earth, as it consisted of loam or vegetable matter, on which, by careful tillage, the finest crops were annually raised. It is these few inches of highly retentive soil into which you should convert the surface of your sandy plains, and from which you may raise remunerative crops.

The first prominent idea to impress on your minds, is the importance of the consolidation or concentration of your manure, that is, of making it occupy the smallest possible space. Why is guano so much superior to any other artificial manure, however scientifically composed? It is because its ingredients have lain, in immense masses, one or two hundred feet deep, for centuries, under the pressure of constant accumulations, until all its virtues have become condensed into the smallest possible bulk; observe also, it has been well stored and protected. On the guano islands it never rains, but there are heavy dews which moisten the top; the hot sun bakes this damp portion into a hard crust, which completely protects it and prevents the exhalation of any of the valuable gases from the underneath layers; and I name this, because I mean to insist also on the principle of this protection as an absolutely requisite part of the process for storing manure. No doubt the night soil, which is now deodorized and manufactured into poudrette and other artifical manures, would be much improved if it could be left for years in large masses to concentrate, under proper protection; and probably this want of concentration by time,

is one of the reasons why, bulk for bulk, it is so much inferior to guano.

In Europe they have a plan of box-feeding cattle; one of the great benefits of this is stated to be, that the manure is only taken out of the boxes once in three or four months, and that it thereby becomes trodden into a hard consolidated mass; now, although it appears to me a preposterous idea that cattle should thrive well, always living over their own manure, (indeed this practice has been clearly decided against in an experiment in New Jersey, conducted by Professor Mapes, with his usual skill and care,) yet it shows that experience has given a verdict in favor of consolidating the manure, the benefit of which, in point of permanence, it is one object of this scheme to exhibit.

Experiments have been recorded years ago, made with long fresh manure against old rotted manure, in which the results were in favor of the fresh manure, and why? Because the old rotted manure had been left unprotected, and the wind and rain had completely exhausted it of the gases and soluble salts, or in fact of its chief virtues; but I have made experiments where the result was much in favor of the old manure, because it had been properly protected and consolidated. Here is a specimen of guano of which I procured a box full, five years ago, from the coast of California; my experiment with it failed, as I expected, because for want of protection the virtue had been washed out of it by the rains and evaporated by the sun; it still, however, contains phosphate of lime and some other valuable ingredients, but not enough to pay freight. So then proper consolidation and proper protection are main points in this scheme. The object then in view,—permit me this repetition,—is to pile up a manure heap for several years, in such a way that not a particle of the useful gases shall escape; besides this, gradual additions shall be made of all the phosphates and other inorganic salts necessary for luxuriant vegetation; the mass must also be kept moist enough for gentle fermentation to carbonize it, yet be sufficiently protected against washing rains. The following are my ideas of the best way of

effecting this object, although it is probable that many good practical farmers may improve very much upon it.

Choose a spot as well sheltered as possible from the wind and rain, dig a trench eight to twelve feet wide, four to six feet deep, and in length according to the manure expected to be made. Throw the soil from the trench on the sides; if loamy it will form a portion of the compost, and if turfy it will be an excellent protection to the sides from rain or wind, when the heap rises above the surface; floor the bottom of the trench with the stiffest soil the farm affords, and beat it pretty hard; (if no stiff soil is to be had, with sweetened bog muck, about eight inches or one foot thick,) slope the trench to one end so that the drainings flow into a couple of hogheads, one at each corner, which should have a slight covering. These drainings should be emptied on the top at each addition; on this foundation begin to lay the manure two feet thick, strewing it plentifully with sweetened bog earth; now if rockweed is at hand, put on one or two inches thick; if none, strew a very small quantity of salt, then a little bone dust, or the ground bones, or phosphate of lime, after it has been prepared with sulphuric acid; then add an inch of loam, or of pulverized clay, half an inch, as there must not be any impediment to a free circulation of heat through the mass; now strew over a little powdered gypsum, which will be better if it has absorbed the moisture from cattle; lay over this about two or three, or even six inches bog muck as a finish, and a few boards to protect from heavy rain. When you have enough manure to make an addition, rake off three-quarters of the covering of peat muck, put on the two feet manure, and proceed as before, always covering up with muck and boards; let the heap dish a little towards the middle.

The following are good ingredients for the heap:—All kinds of animal manure, including contents of vaults, which should first be mixed with sweetened bog muck, with well washed charcoal of refineries, or with powdered gypsum; all vegetable refuse of whatever kind, leaves, weeds, &c., and diggings of ditches and drains; plaster, well ground up, in very moderate

quantities; salt, strewed in small quantity,—this kills insects, prevents fire fanging, and is generally beneficial; loamy or clayey earth, in quantities dependent on the stiffness owing to the proportion of clay, and this should always be rendered pulverized by frost; all brick rubbish, pounded fine; all hair, old woolen rags and refuse of woolen manufactories; ground or pounded cores of horns, and all animal matters and offals; if dead animals are at hand, they should be divided and dispersed about in the heap; if they cannot be cut up, they should be opened and three or four quarts of quick lime, according to the size of the animal, put inside—they should then be covered well with bog muck or charcoal; the lime will soon be very efficient in decomposing them and driving out the ammonia which will be absorbed by the charcoal; with fish, add lime in moderation, for the same purpose, as well as for neutralizing the oil with which it will form a saponaceous soluble compound, and which oil is not of much value as manure. Guano is nothing but fish, which has been decomposed in passing through the stomach of birds, and the bones of fish are rich in phosphates. Phosphate of lime, either in the shape of ground bones, or very finely ground crystalized phosphate of lime, such as has been lately discovered in various parts of this country and elsewhere—this is preferable after it has been treated by oil of vitriol, in the method described in books, for making vitriolized bones; only 25 per cent. of the weight of oil of vitriol would be better than a larger quantity, as it then would leave a portion of the phosphate of lime to be naturally decomposed in the soil and come into play, after the more soluble phosphates had been used up, one great object being to render this compost as permanently valuable as possible.

There exists some difference of opinion respecting the quantity of sulphuric acid to be added to bone or powdered phosphate of lime; some thinking 40 per cent., others 30, and others 20 per cent. the proper amount. It is easy to show that the decision on this point, as well as on many other disputed points respecting manures, depends on the subject we are now discussing, that is, the important one of the mechanical qualities of the soil. The object of adding sulphuric acid to bones or

phosphate of lime is, to produce a phosphate which is soluble in water and can be immediately used by the plant, whereas ground bones alone dissolve so slowly that plants can hardly obtain enough from them each year. Now 40 per cent. of sulphuric acid will produce the largest quantity of soluble phosphate, and if this be used on a sandy, gravelly soil, that part not used by the plant will be soon washed through and lost, and this loss is serious; whereas on a highly absorbent soil, this portion would be retained for future crops. Consequently, according to the retentive power of the soil, 40, 30, or 20 per cent. would be the right quantity. In these light, sandy soils, 20 or 25 per cent. would be enough, as thereby the remaining slowly soluble phosphate of lime would be brought into a state of the finest division, and be permanently useful after the soluble portion had been taken up by the crop or washed away. In a prize essay on this subject, read before the Royal Agricultural Society, in London, Spooner says: "I may, however, observe, that in an experiment during the last season, in which one portion of the land was manured with bones and acid, in different proportions, that which had more bones and less acid, proved a somewhat better crop than that where fewer bones and more acid were used, the expense being the same in both instances." Here all reference to the absorbent qualities of the soil are overlooked, when probably they were the chief elements by which the question was resolved.

I do not advocate mixing lime, except as before-mentioned, or in particular cases, or leached ashes, or sulphate of iron, in the heaps. Lime and ammonia are antagonists; they cannot exist together, and lime being the strongest, always drives ammonia away. It is true that the contact of the atmosphere and of rain converts lime into carbonate of lime, a much less injurious substance, but this is a tedious operation. The benefit which sometimes arises from liming is, that it lightens the soil, and the lime and lime water coming into contact with old lumps of concentrated manure, or with the ammonia left in the soil, sets it free for the use of the crops, but too often liming produces barrenness afterwards, by driving nearly all the ammonia out of the soil, and herein consists the danger of using it. Dr.

Bartlett states, that several farmers in his brother's vicinity, in Illinois, had used lime and thereby reduced their land to a sterile state. The other actions of lime on soils, are unsettled, even in the chemist's laboratory; practically, in the field they amount to little else than probable surmises. Lime is advantageous when used judiciously, but this requires considerable knowledge and practice; it should always be put on the land very sparingly. Where lime is wanted for a crop, such as clover, and there is none in the soil, the form of plaster appears a more safe way of applying it. Leached and unleached ashes containing potash or soda, are nearly as antagonistic to ammonia as lime. Potash is more valuable in the arts than as manure; not so soda; they should be used even on the land in very moderate quantities at a time. On sandy soils, leached and unleached ashes will much assist a good growth of grass, because the ingredients of the ashes help to dissolve the silex of which the land is composed, and silex is one of the main builders up of the stem and leaf of all grasses and grains,—they cannot grow without; but yet it is questionable whether grass made of unusual growth by containing a *large* quantity of silex, is good for cattle; and at all events, the other ingredients, particularly those to form the seeds, should be abundantly supplied at the same time, as there is no nourishment in silex.

After a heap, formed in this manner of about ten or twelve feet high and well protected, has lain three or four years, it will of course have sunk to about half this height; in other words, the manure will have become condensed and consolidated; it will cut through like a dark compact black heavy saponaceous mass; all the vegetable matter will be thoroughly carbonized, and saturated with ammonia and other alkalies, with the phosphates and all the richest elements of manure. It may now be ploughed deep into the soil in liberal quantities at a time, and unlike the light manure usually put on the land which is soon dried up into powdery particles and blown all over the country, it will retain moisture and all its other valuable qualities with the utmost tenacity; it will after some years form a stratum several inches thick of rich retentive soil, well adapted, with annual properly selected dressings, to pro-

duce almost any crop in abundance. It will of course require occasional additions of phosphates and other inorganic salts, without which it would soon share the fate of the formerly rich Western lands.

Before proceeding to the consideration of the artificial manure to be used during the time of storing these heaps, I will discuss a few of what I think errors in the preparation of manure as practised at present. The usual method is to throw every vegetable refuse into the hog pen with a quantity of bog muck to absorb the moisture and gases and to be thoroughly incorporated by the treading and rooting of the animals. Now notwithstanding the addition of the muck, much of the very valuable portion of the manure is evaporated in the atmosphere, during the time that this turning over and incorporation by the animals is going on. The smell of such a hog pen is just this rich portion evaporating, and, as hog manure is the poorest of all animal manure, there is not much to spare. I will say nothing of the health of the animals breathing this atmosphere. All manure from animals, particularly the liquid part, commences decomposition in ten or fifteen hours after it has left them; it then begins to form various gases which escape into and mix with the surrounding air. These are the most valuable parts of the manure, and although a portion of them is absorbed by the carbonaceous muck thrown in, yet a large portion escapes. When hot stable manure is taken out, much of the vapor arising is a great loss to the quality of the manure. As a general rule therefore all animal manures should be taken to the heap as often as the quantity amounts to sufficient to make it worth while to carry, and then put under protection as before mentioned. If there be a deposit of peat muck on the farm, it becomes an essential and important ingredient of the heap, and requires some study in order to avoid error here also. All peat muck is a carbonaceous matter arising from the decomposition and concentration during ages of vegetable matter, chiefly of such plants as thrive in wet and watery situations. This muck is mixed with such acids as arise from the decomposition of the juices of vegetables of this nature and from stagnant water, and they are generally injurious to the growth

of many crops. The chemist's advice is often followed to neutralize these acids by lime or by other alkalies, potash or soda salts if cheap and at hand, or, when put in the hog pen, by the ammonia from the excrement. Now this neutralization, which in other words is the making of the acids inert or no longer acid and injurious by these additions, does not get rid of them; they are taken into the soil in this neutralized state, and are either washed out by rain in this state, combined with the neutralizers, or, if the growing crops use up the neutralizing alkalies, the acids appear again and must again be neutralized.

Now these acids are generally soluble in water; the best way therefore to treat the peat muck is to wash it as well as can be done. It seems to me that the best plan would be, where there is no fall of land, to drain such a peat bog by cutting a trench through the middle and allowing a natural washing by rain, to cart it on to a piece of land where there is a gentle fall, lay it out in layers or winrows with gutters between, so as to drain away the water impregnated with the acids, and let it be exposed to the rains of spring and autumn. If properly managed one season would thus sweeten it, and leave a residue of nearly pure charcoal fit for incorporation with the manure heap and requiring no neutralization. I leave out of question the idea of decomposing and rotting this muck by admixture with hot lime or any other substance; it is wanted in its present state of a carbonaceous mass, only sweetened as I call it and as you will better understand it, by washing out and getting rid of these injurious acids forever.

In justice to science I must again remark that by charcoal in this address is not meant pure scientific charcoal, but merely such substances arising from decompositions of organic matter, whether of animal or of vegetable origin, as absorb the valuable portion of manure. The more intimately this sweetened muck is incorporated with manure the better; although to this there is this limit, the manure must not be turned over again and again for the purpose of this incorporation, for by so doing the valuable parts are lost in the atmosphere. This is a great error with those who use guano; they insist that it is too

strong, and *will* mix it with loam or other substances, and turn it over and over until one half the ammonia has evaporated in the air, as I shall presently show you; it is then weak enough, and they have got rid of one half the substance without any return, on the quantity of which in the original guano its market value depends. You will now I hope see the reason why it is proper to finish off each addition to the manure heap by a few inches of this sweetened peat muck; it absorbs and retains the gases arising from the manure.

It is no longer necessary for me in 1851, as it was in 1845, to detail the advantages of guano. Its use is reviving the worn out lands of the southern sections of the States. In several parts of Virginia, land, which but a few years since was in vain offered at five dollars the acre, is now worth and selling for fifty dollars per acre, this change solely arising from the crops produced by the application of this manure. In these northern sections we have been quite behind hand on this subject, although I believe that those who have judiciously applied guano here have had no reason to repent. In England, where its use is best known by the practical experience of twelve years, the importation for the first seven months in 1849 was 51,481 tons; first seven months in 1850 was 69,937 tons; and the importation for the first seven months in 1851 was 131,009 tons, in value about six millions of dollars, or nearly double. These are from late official documents. So that on the subject of the efficacy of this manure, no doubt can exist. It is even coming into use in China, where it is sure to find its true value. The cost at which it can and will be sold here, and in the other large ports of the United States, is about $45 per ton, or two cents a pound. Now 350 pounds is ample for one acre; consequently the cost will be $7 per acre for the manure.

The only trouble that remains is the method of its application, and although more may be learned by practical experience than any other way, yet some assistance may be afforded by verbal information. I have read with surprise the various recommendations for its application, in the periodical publications of the day. Some recommend ploughing in the autumn

that it may become mellow by the spring. In this sense I do not know what *mellow* means. Others advise mixing it with different substances, and turning it over until thoroughly incorporated, and thus much of the ammonia is evaporated in the atmosphere. Now the most beneficial method of using guano depends again on the very principle we have been discussing, viz., the mechanical properties of the soil. On a moderately stiff clay it might perhaps answer to plough it in during the autumn; the clay would absorb the ammonia and soluble salts, and the phosphate of lime remain unaltered; but the work must be thoroughly done, as every particle of guano exposed to the atmosphere would be rendered nearly useless to vegetation, and on light lands this practice would result in the total loss of the most beneficial parts of this manure. Here the most economical way would be to make two applications during the spring, when feasible, say one-third under the seed when sown, but without touching it, and two-thirds just under the surface, when the plant is one month old. This method is easy with Indian corn. One-third may be used in the hill, and two-thirds with the cultivator, afterwards. With other crops, however, it is not so practicable. But every soil should be thoroughly examined as to its absorbing properties before the best method can be put into practice. I have no objection to mixing it with very moderately damp charcoal, with dry plaster of Paris or dry loam, turning over as little as possible and covering up immediately with guano bags, a layer of charcoal or plaster being on the top; all moist mixtures are improper—the ammonia, when moistened, becomes like hartshorn or liquid ammonia, and evaporates in the air. You will observe when I hold this glass rod thus, moistened with muriatic acid, over this dish of hartshorn (ammonia) a white cloud arises; this proves the escape of ammonia. On holding the same glass rod over this guano, you observe the same white cloud; hence it is clear that ammonia is always escaping from guano at common temperatures, when exposed in the atmosphere. Therefore, when mixing your guano, a glass rod, with a little muriatic acid, held half an inch or less from the heap, will show you if you are losing the ammonia, which is the part that costs the most money, and is the most valuable.

This is often a good test to know if your guano has been properly ploughed in; go over the land with such a stick, and observe if it produces fumes anywhere. For Indian corn, for wheat, rye and other cereals, for grass, for potatoes, and, above all, for turnips, guano is a most excellent manure, and, with an outlay of $8 per acre, all charges included, will give as large, and a more nutritious crop than any other manure, and will amply repay the expense. Permanently therefore to improve light lands, I strongly advise a course of three or four years' action with guano, and during this period a careful accumulation and consolidation of manure, to be then put on to the land in large quantities at a time, but always to keep on hand a back stock for future use, and never to apply it until three, four or more years old.

I am entitled to give this advice, as I have used guano alone on a miserable soil for six consecutive years, and have had at least as good crops as those who have used barnyard manure. I have a letter from England dated 19th September, from a gentleman whose position enables him to possess intimate knowledge on this subject, in which, after noticing the arrival of cargoes of guano from Shark's island, Australia, and Seychelles islands in the China sea, and giving me the relative values compared with the Peruvian, he observes; "Guano is quite established here now, and farmers know for certain that it doubles their profits." And with respect to the manner of storing manure, others may probably adopt better ways; my chief desire has been to point out the principles, leaving the practice to more experienced hands.

It is not to be expected that men who like myself have passed much time in cities, should be acquainted with all the practical details of the agricultural profession; but this I may with certainty affirm, that of those points of husbandry to which I have paid any attention there is not a single one, but what may be considered as susceptible of very great improvement by the application of the powers of the cultivated mind, and it is the want of practical faith in this assertion which has hitherto been the greatest bar to the dissemination of more knowledge on agriculture by education; as if agriculture could

stand still, while knowledge on all other subjects is progressing at a railroad pace.

It seems to me, however, that the movements of the large agricultural bodies, representing the most intelligent of this class, are slowly, but surely, indicating daylight on this momentous subject of agricultural education, and also that this is the most propitious moment for making a strong move in the community. With all my zeal in this business, however, I cannot too much recommend caution, cool deliberation, and above all singlemindedness in the prosecution of this important work; a failure in any part of it would cause infinite regret, as well as a postponement for years of any further efforts.

REPORT ON THE POTATO ROT.

The Joint Standing Committee on Agriculture, to whom was referred the various communications which have been received by the Secretary of the Commonwealth, concerning the Potato Rot, having attended to the communications,

REPORT:

That fifty-two different persons, from various parts of this Commonwealth, and fifty-one others from other states and the British Provinces, have communicated their views, or proposed questions. Very many of them are of no value, and do no credit to their authors. But others have been prepared with great care, evince careful observation, sound reasoning, and much good sense. As a whole, the treatises are believed to embody nearly all that is known upon the subject to which they relate, and to contain many valuable suggestions and recommendations. These papers have been called forth by the reward offered by the Legislature, and common courtesy requires, through us, an acknowledgment of their reception; while justice to both, the State which *may* be called upon to pay for a valuable discovery, and to discover who is entitled to the privilege of having the soundness of his theory and the efficacy of his remedy put to the test by cultivators everywhere, make it highly proper that the substance of each communication should be published. Your committee, therefore, recommend that the Secretary of the Commonwealth cause a synopsis to be made of the contents of the several communications

which he has received, relating to the potato rot, and he cause the same, with the name and residence of each writer, to be published as a part of his collections from the transactions of the Agricultural Societies of the Commonwealth.

For the Committee,

March 13, 1852. ALLEN PUTNAM.

A

SYNOPSIS

OF

THE SEVERAL COMMUNICATIONS ON THE CAUSE AND CURE

OF THE

POTATO ROT;

RECEIVED BY THE EXECUTIVE OF MASSACHUSETTS.

PREPARED AND PUBLISHED UNDER THE AUTHORITY OF THE LEGISLATURE,

BY AMASA WALKER,

SECRETARY OF THE COMMONWEALTH.

BOSTON:

DUTTON & WENTWORTH, STATE PRINTERS,

No. 37, Congress Street.

1852.

The communications from which the following extracts are made were sent to the Governor of the Commonwealth in consequence of the following Resolve of the Legislature, approved March 22, 1851 :—

Resolved, That a reward of ten thousand dollars be offered to any person, within this Commonwealth, who shall satisfy the Governor and Council, that, by a test of at least five successive years, he has discovered a sure and practical remedy for the Potato Rot, and that a warrant be drawn therefor accordingly.

ADVERTISEMENT.

Commonwealth of Massachusetts.

SECRETARY'S OFFICE;
March, 1852.

THE object of the following compilation is to present the views of a great number of persons in a form so condensed as to render them available and useful. To publish them at full length would make a volume too formidable in size. Few would have the courage to undertake, and fewer still to accomplish the reading; while the expense of publication would render it inexpedient.

Much time, labor, and patient research, have been expended by many of the writers, and by some of them from purely unselfish and praiseworthy motives; while the task of reducing the whole to a small compass, and yet retaining the views, principles, and chain of reasoning of each, in such manner as not to give reasonable offence to the writers, has been attended with no trifling amount of labor.

Although these communications, an abstract of which is here given, may not furnish any perfect cure or preventive of the potato disease, yet they agree in so many important points, and offer so many valuable hints, relating to the nature, cultivation, preservation and improvement of the potato, that they cannot fail to be of great public utility.

The similarity of views expressed by the most intelli-

gent and experienced writers, relating to the nature, cultivation, disease and cure of the potato, is truly remarkable, and we think auspicious.

Among the principal points, relating to which there is a general concurrence, are the following:—

The Soundness and Vitality of the Seed. Renewing the seed from the ball of healthy vigorous plants, every few years,—even resorting to the native place in South America, and taking the seed from the wild potato, is considered important. When potatoes are to be raised from the tuber, sound healthy *whole* potatoes are recommended for planting. Cutting potatoes is decidedly condemned. Anything which impairs the vitality of the seed increases the liability to disease.

Quality or kind of Soil. A dry, light, loose, warm soil, is considered necessary to the soundness and health of the vegetable, as well as to its richness and flavor; the latter depending quite as much on the quality of soil, as on the variety of seed. A wet, heavy, compact soil, directly promotes the disorder. Far up on the side of a mountain or hill is a favorable location for the growth of the potato; and new land contains more of the qualities requisite for its nourishment and health, than old or worn out soils.

Influence of Atmosphere. Potatoes should be as little exposed to the air as conveniently may be. Their natural place is under ground. By too much exposure they become poisoned and turn green. Some recommend depositing them for the winter in holes under ground in a dry soil; or if kept in a cellar, to preserve them dry, in small quantities, in sand; and to keep them cool. Keeping large quantities in a body in the cellar is by some supposed to promote heat and putrefaction. Planting in the fall is recommended by some, as potatoes left

in the field, over winter, are observed to come forward earlier in the spring, to grow more vigorously, to get ripe earlier and before the blighting rains in August, and to be more sound, fair and healthy.

Manures. All antiputrescents, such as lime, wood ashes, pulverized charcoal, plaster, salt, nitrogen, &c., are believed to contribute directly to the health of the potato, as well as to add to its richness and flavor; and, of course, to prevent putrefaction and disease. Of other manures, well rotted compost is preferred. Stable manure is too strong and heating, and produces ill-flavored, unhealthy potatoes, and is decidedly condemned.

Disease—Contagion—Old Age and Death. These are common to vegetables as well as animals. All are liable to disease, some more, some less, according to circumstances, predisposing causes, and preventive means. Some vegetable diseases are believed to be contagious. The present disease is thought by many to be of that class. One field of potatoes is liable to take the disorder from another field. Potatoes are predisposed to disease, by bad cultivation, old age, bad soil, bad manures, sudden changes of weather, warm rains, &c.

Ravages of Insects, Fungi, &c. The best writers consider the ravages of insects as at most but a predisposing cause, rendering the potato more liable to disease by enfeebling the plant. By many writers insects are considered as remotely affecting the potato; by others, as having no effect at all. The fungus on potatoes is not the *cause* of the rot. It finds the potato, previously diseased, a fit subject for its operation.

The general conclusions to which the facts presented in these various communications seem to lead us, are—

1. That the disease bears a striking resemblance to the cholera, and probably exists in the atmosphere.

2. That it is doubtful if any specific cure has been, or ever will be discovered; but

3. As in cholera, certain preventives are well ascertained, by the application of which, the liabilities to disease may be greatly lessened.

4. That by obtaining the soundest seed, by planting in the most favorable soils, and by using the most suitable manures, we may have a good degree of confidence in the successful cultivation of this useful vegetable.

5. That we may expect, that like the cholera, the potato rot will become less and less formidable from year to year, and eventually subside into a mild and manageable *epidemic*, if that term may be used in such a connection.

COMMUNICATIONS ON THE POTATO ROT,

FROM CITIZENS OF MASSACHUSETTS.

NAMES ALPHABETICALLY ARRANGED.

Adams, Ichabod, Duxbury. Potatoes half grown when dug, would produce earlier potatoes than those full grown. Best time for planting, May 25 to June 28. Dig as soon as the vines fail.

Barber, Jos. S., Gloucester. Thinks mildew the cause; early planting the remedy.

Bassett, Samuel, Taunton, having had twenty years' experience, believes, like others, that the potato has run out by age, and recommends planting potatoes that bear plenty of balls, and renewing the seed from the balls often, and at a distance from the diseased ones.

Bradford, Wm. J. A., Boston, in a printed pamphlet of 46 pages, evincing extensive reading and deep research, and written with fluency and ability, expresses nearly the same sentiments as to the nature of the potato, its discovery, cultivation, kind of soils and manures best adapted, the causes of its decay and disease, with the means necessary for its renewal and restoration to health, which have been expressed by Mr. Dawson and other able and experienced writers. Those who have leisure and inclination to read these opinions at large, would do well to procure the pamphlet. Here, only a condensed account, or brief abstract, can be given.

The authorities quoted by Mr. Bradford represent, that the potato was, for a long time, used only as a delicacy,—cultivated

in gardens, by a few persons, for almost a century. The year 1663 is mentioned as the date when it began to be more generally cultivated—*in gardens*. It did not become an article of *field* culture till the early part of the eighteenth century, 1730, in Scotland; soon after, more at large in England; probably not earlier in this country.

The flavor of the potato is said to depend on the quality of the soil. The same variety of potatoes "will have a strong, unpleasant flavor in one soil, that has a sweet, agreeable one in another. In a heavy, wet soil, or a rank, black loam, though the crop is often abundant, it is scarcely ever palatable. Siliceous soils, even approaching to gravel, are always to be planted in preference to the above. A dry, mouldy, fresh and moderately rich soil, is unquestionably the best for every variety of the potato. The black skinned and rough red thrive better than any in moist, cold soils."

There is a marked difference in the nutritive quality of potatoes, which was supposed to be depending on the variety, though quite as likely on the soil.

The common mode of cultivation by the tuber, or eyes of the tuber, being the only profitable and convenient mode, has afforded a temptation, when a good variety was obtained, to continue to cultivate that variety, by the tuber, too long—till the decay of old age had manifestly affected them. Varieties obtained from the seed of old plants will sooner feel the debility and decay of old age. When resort has been had to seed, it has generally been from those varieties which had long been in popular favor,—that is, the oldest. A greater mistake could not be made. The seed should be selected from the most vigorous plants.

Mr. B. condemns the practice of planting cut potatoes, instead of whole ones.

The question of locality, or native place of the potato, is becoming one of interest, as it may become necessary to resort to the wild stock again to replenish and renew our own. Humboldt says the potato is not indigenous in Peru, and not to be found wild in any part of North America, but on the western side of South America only. This is controverted by

Mr. Smee, another author. "Don J. Pavon says, that Solanum tuberosum (the potato) grows wild in the environs of Lima, and fourteen leagues from Lima on the coast; and I have found it in the kingdom of Chili;" and Mr. Lambert adds, "I have lately received from M. Pavon very fine wild specimens of Solanum tuberosum, collected by himself in Peru. In Chili, it is generally found in steep, rocky places, where it could never have been cultivated, and where its introduction must have been almost impossible. It is very common about Valparaiso, and Cruikshank has noticed it along the coast for fifteen leagues to the northward of that port; how much farther it may extend he knows not." From all accounts of the native place of the potato, it must be supposed that a mountain country is most congenial to its habits.

The varieties of the potato are very numerous. A list of 160 kinds has been seen in England; and, in this country, they are believed to be not less numerous. Mr. Cole, late editor of the New England Farmer, is said to have raised forty new varieties from the seed.

The reproductive power of plants is in the seed only. It is only by the development of the embryo contained in the seed, that a *new life* can be produced. This embryo of life is not fully developed at once, but continues gradually to be developed in the production of new parts,—of buds especially, which are embryo branches springing forth, multiplying the limbs, extending the plant, and changing its form. These buds, if suffered to remain and vegetate on the parent stock, become new branches only; but if removed from the stem and placed in the earth, in a condition to grow, become a full and perfect plant instead of a branch of the parent. In this case, however, it is merely the extension or multiplication of the form of the life already in being, and not a new life,—not a new individual.

This principle is considered important, as being the basis on which the author's ideas of the disease rests, and he gives some authorities in confirmation.

Dr. James E. Smith, a scientific writer on botany, says:—"By buds, as we well know, plants are propagated, and in that sense each bud is a separate being, or a young plant in itself;

but such propagation is only the extension of an individual, and not a production of the species, as by seed. Accordingly, all plants increased by buds, cuttings, layers or roots, retain precisely the peculiar qualities of the individual to which they owe their origin." He further says: I cannot but assent to Mr. Knight's opinion, that "*each individual thus propagated has only a determinate existence, in some cases longer, in others shorter;* FROM WHICH CAUSE MANY VALUABLE VARIETIES OF APPLES AND PEARS, KNOWN IN FORMER TIMES, ARE NOW WORN OUT, AND OTHERS ARE DWINDLING AWAY BEFORE OUR EYES.

"Gardeners know how many of the most hardy perennial herbs require to be frequently renewed from seed, to exist in full vigor; and though others appear, to our confined experience, unlimited in that respect, we have many reasons to believe they are not so. Propagation by seeds is therefore the only true REPRODUCTION of plants, by which each species remains distinct."

Again this author says—"Having examined the general structure and external forms of plants, we now come to more important and even essential, though more transitory organs—the flower and fruit. *By these, each species is perpetually renewed without limits*—while, as already mentioned, *all other modes of propagation are but the extension of an individual,* AND SOONER OR LATER TERMINATE IN ITS TOTAL EXTINCTION.—Those apple trees which have been continually propagated for above a century by ingrafting, are now become so diseased that though the fruit retains the same flavor, the trees are worthless; and grafts, inserted in other trees, are only *an elongation of the original tree, and must feel the effect of age, like the tree they were taken from.*"

The natural place, or native place, of the potato seems to have been about latitude 35°, but being a hardy plant, it has become naturalized throughout Europe and this country—from the equator to 70° north. The tuber, in its native state, is said to be very small, about the size of a nutmeg; its present enlarged size being caused by cultivation.

THE DISEASE. That which has life must experience decay and death. Unless endowed with immortality, there must be

a dissolution of the physical organism, and of course, there must be disease. The theory which Mr. B. intends to establish is, that if fungi are present in the diseased potato, they are there because the tubers are previously in a condition suited to afford them aliment—that is, they are already in an unhealthy, enfeebled condition. That condition is *old age*. The potato has for the most part been propagated from sets or buds, for a long course of years. Occasionally some have been raised from the seed, but mostly from the eyes of the tuber, which is only an extension of the same individual life, not a production of new life. In addition to this, it has been subject to a forced cultivation, in a climate not indigenous. These conditions would be likely to have much effect in shortening life. Though, therefore, the immediate disease may be connected with fungi, the ultimate cause is old age—the disorder to be remedied. This opinion the author published in an agricultural paper in the year 1845–6. Since then, statements have been published to show that some potatoes recently from seedlings have taken the disease. This does not invalidate the above opinion, though at first it might seem to have that effect. For if a plant is raised from a seed, which was produced by a diseased or very aged parent, it would be almost as liable to disease, as a bud taken from the old stock. The theory here advanced is founded in an immutable law of nature, attached to all forms of life, and all organized matter; and that law is dissolution.

In the Farmer's Encyclopedia, 1844, art. Canker, it is said, although young trees are liable to this disease, yet old age is the period most obnoxious to its attacks. Notice, it is not a young tree which has been lately grafted. If the tree, from which the scion has been taken, is an old variety, it is only the multiplication of an aged individual. The scion may, for a few years, exhibit signs of increased vigor, owing to the abundant supply of healthy sap from the stock, but the scion will afterward become as decrepid as the parent tree. The unanimous experience of naturalists agree in testifying that every organized creature has its limit of existence. In plants it varies from a few months to as many centuries; but of all, the days are numbered.

Some fruit trees are affected with the canker, especially the apple tree. Mr. Knight asserts, from his own experience and observation within the last twenty years, that this disease becomes progressively more fatal to each variety, as its age increases beyond a certain period, and that all the varieties of the apple which he has found in the catalogues of the middle of the seventeenth century, are unproductive of fruit, and in a state of debility and decay. Those are most exposed, which had an excessively vigorous growth in their early years.

The potato disease appears in three forms. The first, a shrinking internally, leaving a hollow in the centre, called gangrene. Another, where the tuber becomes soft, pulpy and moist, like a rotten apple. This is the moist gangrene. This is the disease which has caused such loss to the farmer, such detriment to the State, and deprived both man and beast of much wholesome food, which was formerly a source of much wealth. A third form is distinguished by a collection of black, dry matter, in the body of the tuber. This prevailed to some extent, a few years since, but whether a distinct disease, may admit of doubt.

Remedy. At an early stage of the disease, when its ravages were more confined to old subjects, in a state of debility and decay, Mr. B. thinks it might have been arrested by resorting to seed, instead of raising from the tuber. Such a practice, even now, he thinks might be of great benefit, and, if generally followed, would reduce the disease from an epidemic to a sporadic character, and might possibly effect a cure. And this is the remedy, which it was the writer's purpose to propose. Two auxiliaries are suggested by him.

Planting the potato in the fall has been considered in England and France a useful practice. It was adopted in England at the beginning of the present century, when the disease called the *curl* was very prevalent. It has been lately recommended in France, as a cure for the present disease.

The application of salt is the other auxiliary. This has been used with effect as a preventive and cure of the mildew; and if the disease in the potato is in part owing to fungus, it is reasonable to suppose it may be fatal to this also. The mode

of using salt, is to sprinkle on a solution with a waterpot, or to spread it on with a plasterer's brush, in proportion of one pound to a gallon of water. But Mr. B. has more faith in new land, the application of salt and wood ashes as a dressing, and the avoiding of all stable manures.

The application of copperas has proved very effective in France in restoring debilitated plants. This is applied in solution by watering, or by reducing it to powder, and sowing it mixed with fine soil. Its effect has been very speedy. Where healthy plants are attacked, the use of salt or copperas may be expedient, with the use of new land and fall planting. But all these cannot give immortality to the plant. In length of time it must decay. To many varieties which have been long cultivated, that time has already come. The ravages of disease may therefore be continued, so long as these old varieties, long from the seed, are continued; and even a remedy in this respect will not in all cases prove effectual; for the child may be attacked as well as the old man. No period of life, either animal or vegetable, is absolutely exempt from disease. But a conclusion, that the disease is not in consequence of old age, because young plants are sometimes attacked, would be very erroneous.

The long continued practice of raising from the tuber, however, may have affected all the varieties now in use with such a morbid predisposition, that no healthy seed can be obtained without resorting to the wild plant in its native place.

Mr. B. does not propose the use of salt, or fall planting, or copperas, *as distinct remedies*, but *renewing* from the *seed.* The former may be useful as *aids* in certain cases.

There has been too much forcing, stimulating and heating, in the cultivation of potatoes, producing a bad flavor, as well as weakening and shortening the vitality of the plant. He would, therefore, recommend *renewing from the seed—new land*, with the use of *salt*, and *soot*, or *wood ashes.*

Brooks, Elisha, New Ashford. Recommends a mode of cultivation not unlike that ordinarily pursued—planting 1st of

May, on *old* land—spreading manure on the surface, hoeing it under—cutting large potatoes—placing the pieces a foot apart.

Beaman, C. C., Wellfleet. *Remedy.*—Plant *sprouts* instead of the bulb, three inches under ground. A lady has tried this successfully. She believes the disease is in the bulb, affected only by the soil and climate.

Burke, P. B., Boston. *Preventive.*—Take equal parts of hen-manure and loam, mixed, one quart in each hill at planting.

Chard, Granville, Gloucester. *Cause.*—Mildew. *Remedy.*—"When the blossoms begin to fall, cover them with earth."

Dadd, G. H., Boston. Essay of twenty-two pages. He thinks the causes, like those of the cholera, are involved in much doubt and uncertainty. He believes the disease contagious, and may be transmitted by atmospheric agency from one region to another. Vegetables are capable of receiving into their organization infectious matter, and of respiring poisonous miasmata as readily as animals. Both require atmospheric food." A knowledge of the similarity between vegetable and animal nature enables us to preserve their identity and prevent diseases. He compares the commencement and growth of vegetables with animals—the diseases of one, with those of the other—the potato-rot with the cholera. Diseases may be hereditary or acquired. The same laws of propagation and improvement apply to vegetables and animals. "Like begets like." An unhealthy plant cannot produce good fruit. Due care should be observed in the selection of seedlings, as well as preserving them in their purity. The vital principle must not be compromised by mixing good seed with inferior varieties. Potatoes may be affected, as grapes, wheat, &c., are known to be, by soil or manure.

Many theories have been suggested, all of which have been more or less conflicting and unsatisfactory; as the "Fungus theory," "Insect theory," &c. &c., many of which are *effects* which require a *cause.* Fungi are not found in healthy veg-

etables. Fungus growth is slow in its developments. The small vessels of the tuber which lead from centre to surface become obstructed, or partly paralyzed, and its power of throwing off excrementitious matter impaired. Fungi are only *symptoms* of a loss of vitality, mere effects. Preceding these were other manifestations of disorder; such as soapy taste, &c. "I consider fungi to be of hereditary origin, although at first acquired." The changes have been so gradual as not to be suspected. Many of the external morbid growths on vegetables originate within, while they are supposed to be external causes.

The insect theory could have but a secondary effect in producing or extending the rot, for many of the insects found about the plant result from the decomposition of the tuber. Although these cannot produce the rot, they act in conjunction with other causes in producing disease. The vitality of the potato may have been compromised by *transplanting*. It is supposed to be indigenous to South America. How far it may have suffered by transplantation is difficult to decide. The Almighty made the races of animals and vegetables to be healthy, but if his laws respecting them are violated by an inferior cross fecundation, or want of due care in the selection or preservation of seedlings, or any other extraneous circumstances or agents, we may expect to find them involved in general ruin.

To preserve the identity and life of the potato—

First. Plant a perfect germ—largest potatoes are best.

Secondly. Plant *ripe* seed.

Thirdly. The soil and climate must be congenial.

Lastly. The different varieties must be either planted separately; or, if improvement be designed, it must be accomplished through the congress of superior plants. With the first requisite there is no compliance. With the second, the practical farmer will not contend. The third requires a knowledge of agricultural chemistry. The fourth is too often violated. The varieties, like the different breeds of animals, are so amalgamated as to render it difficult to find pure stock.

From these remarks it is evident that the causes, hereditary or acquired, are various, operating directly or indirectly in de-

stroying the vitality of the potato. The disease, the last season, was of a putrid type, capable of communicating itself not only by contact or proximity, but of sending its specific and active poison "on the wings of the wind," over a wide-spread territory.

These remedies may be rendered available in a great majority of cases, by care and attention,—not without. Old woodlands, abounding in small, loose stones; elevated situations, and hill-sides sloping to the south, are the most favorable locations.

Dimock, S. R., Springfield. "Believes the cause to have been, that the potato has been so long produced from the root instead of the seed—the cure will be to propagate from the seed contained in the balls." Reasons at least plausible are contained in this communication.

Dingley, Isaac, Marshfield, thinks this the *remedy*:

"Dry the seed. Take potatoes weighing an ounce or little more; cut them as you please, and dry them two days of fair weather, in the open air, without freezing, before planting."

His opinion of the cause will be given, if called for.

Eastman, R. R., Granby, concludes from an experiment, that charcoal, ploughed under, will prevent the rot in potatoes planted on such ground.

Evans, Thomas L., Brookline. *Cause.*—Atmosphere—same as that of cholera. "*Remedy.*—The day before the first hoeing, spread six to eight bushels of good wood ashes to the acre." These will be drawn around the plant at hoeing. As to atmosphere, it must be cleansed by fire and smoke. Build fires in the middle of the field, about nine o'clock in the evening, when there is no wind, twice a week, from middle of July to time of ripening. Cleanse the cellar also by fires.

Farwell, Grata, Lancaster. *Cause.*—A striped bug feeding on the leaf. *Remedy.*—Sprinkle slack-lime and ashes. Plough in the fall.

Farmer, J. B., Concord. *Cause.*—Atmosphere. *Cure*, (discovered by accidental experiment.) Before planting spread the potatoes on the surface, in the sun several days, until they turn green.

Flanders, Phanuel, Lowell, (four papers.) *Cause.*—Dark-colored bug feeding on the leaf. *Remedy.*—Plant early. When the vine is attacked, spread on the vines slack lime, or lime wash.

Fessenden, A. F., Lexington, having had considerable experience in raising potatoes, gives it as his decided conviction, that scientific gentlemen who have written on the cause and cure of the potato rot, have entirely overlooked the simple laws of nature in which the cause is to be found. By accident, he has been confirmed in an opinion he has long entertained.

In 1850, in digging his field of potatoes carelessly, he left some potatoes in the ground, which field in 1851 he planted with corn. Finding at hoeing time some scattering plants of potatoes, he carefully preserved and cultivated them, which at the time of digging produced sound, healthy, fine looking potatoes, which continued free from any appearance of disease whatever. This suggested to him the benefit of burying potatoes, designed for planting, in a light, loose soil, at a sufficient depth to be free from the frost, and letting them remain till wanted for planting. In this way they will retain their generative qualities and produce healthy plants. Drying potatoes in the sun after digging, and then depositing them in large heaps of fifty to one thousand bushels, in bins, causes them to take heat, partially destroys their vitality, and of course, injures them for planting. The practice is a violation of the laws of vegetation, and has been continued till the crop has become a failure. Potatoes should be buried in the ground below the operation of the frost—not in large heaps, but in such manner as to preserve the generative qualities of the plant, and the laws of nature will work their own cure. The result of further experiments will be given hereafter.

Gale, Geo. W., Lowell. *Cause.*—At a certain growth of the vine, "a copious dew or fog condenses upon the tops, for two or three nights in succession, which moisture being suddenly evaporated by the powerful rays of the sun, causes partial death to the leaves and small branches, by some called rust, causing the sap to descend from the diseased tops to the potatoes, generating the rot.

Remedy.—Procure northern seed, spread them on the sunny side of the fence, cover them with horse manure to sprout. Plant early. After the death-dew, mow close to the ground. Dig late.

Hale, Joshua, Lowell. *Cause.*—Atmospheric influence—"an extra supply of nitrogen and some ammonia, that rises from the earth like a dew upon the leaves and branches, penetrating and mixing with the moisture of the vines, causing putrefaction. *Cure.*—Spread dry slack-lime over them once a week, not enough to injure the vines, till it whitens the ground. It will moisten sandy land, and dry and warm the cold, wet land."

Hartshorn, Jacob, Dover, "believes the disease is in the air, as the cholera is supposed to be, and generally makes its appearance about the last of July or first of August, when I cut the tops off even with the ground, without injury to an early crop;" and before late potatoes send up new tops, the disease will have passed away.

Hastings, Theodore, of Adams, thinks a sure and practical *remedy* consists of a mixture of *ground sand* and *pitch.* The sand must be pure *silex*, such as is used in the manufacture of flint glass. The pitch, (or resin can be used) must be finely pulverized and mixed with the sand, in the proportion of one part pitch, in bulk, to two parts sand, applied at the time of planting, three table spoonfuls to each hill. On wet, rich, or old soils, two spoonfuls more may be applied when the plant has acquired the height of six or eight inches.

Hatch, E. F., Dorchester. *Remedy.*—"Resort to the original

seed and commence anew." In the mean time pursue the following course, to prevent the disease with the present seed. "Let ground charcoal and sulphate of lime (gypsum or plaster of Paris) be mixed in proportion of two to one of the former, and applied according to the quality of the soil. On rich land, put one quart in each hill at planting; on light, sandy soil, one half that quantity. Two or three weeks before the potatoes ripen, prune them of half their branches, and throw a handful of this compound on each hill.

Honey, S., Lowell. *Prevention.*—About the time of planting, strew 120 pounds of salt on the acre.

Horner, Andrew, Georgetown. *Cause.*—A bug depositing poison in the blossom, which enters the sap and flows into the potato, hence some stalks are affected sooner, some later, and some not at all. *Cure.*—Crop the vines when full in blossom, for as soon as the poisoned sap enters the potato, it inoculates, and will cause rot sooner or later.

Isley, A. B., Cambridgeport. *Remedy.*—Plant *under* the manure between 20th and 25th of April. Between the middle and last of July pull the vines out so as to leave the potatoes in the hill. Dig between 20th and 30th of August.

Kelly, James, Boston, proposes that government employ him to try experiments.

Kenrick, E. B., Cambridgeport, has satisfied his own mind that the *cause* of the potato rot is an excess of positive electricity in the potato itself. The disease therefore may be prevented by negative electricity, applied to the potato while growing. The best and cheapest remedy is a manure, containing a due proportion of black, meadow mud—not peat, nor marsh, nor pond mud, nor salt meadow mud—which will gradually and continually supply the potato with negative electricity during the growing season. Allowing sixteen hills for a bushel of potatoes, one heaped peck of mud is sufficient, but before it

is applied, it should be well mixed with an equal quantity of stable manure, by "forking over" the same twice during the month, immediately preceding the planting.

King, S. B., Sutton. Thinks the cause atmospheric. South winds with excessive heat overpowers the plant, which is feeble for want of those substances which formerly gave strength of resistance. This power to resist heat and cold he thinks the exhausted state of the land of late years has failed to supply. The use of wood ashes and oat straw, he thinks, would, in a few years, furnish the requisite nourishment.

Legg, William, Blackstone. *Remedy.*—After the potatoes have grown as long as they will before the blast strikes the vines, cut close to the ground all that are designed for planting the next year, keeping and planting them separately from the other potatoes.

Monto, Louis, Boston, asks one or two questions.

Morse, Aaron, Petersham. *Cause.*—Planting too closely—leaving not sufficient space between the hills, the tops are blown down by storms, and left to rot. Hence the remedy, Plant in hills four or five feet asunder.

Newell, Austin, Monson. *Preventive.*—Plant seed free from disease, on land not wet. Change place and kind of soil each year of planting.

Nickerson, Samuel, South Dennis, thinks the remedy, or preventive, may be found in a free use of lime. He says—"Last year (1850) my potato crops went by the board; they were not dug, because they were not worth the labor. This year (1851) I limed the land heavily on the surface while planting the crop, and during its growth, kept the vines well white-washed, frequently stirring the soil between the rows, and the result was, that not more than a dozen rotten potatoes were found in the whole." In 1851, Mr. N. again tried the

same experiment with the same success, including his neighbors, who had before lost all.

O'Kane, Thomas, Boston. *Preventive.*—Put a small quantity of lime and rock salt in the hill at planting. When the potatoes are out of the ground, sprinkle over them a mixture of common ashes and chimney soot.

Proctor, John W., Danvers, incloses a communication from Thaddeus William Harris, which concludes, that "insects have no concern or connection with the potato disease."

Reed, Lyman, Waltham (four papers). Presents a communication purporting to contain his investigations, sealed up and addressed to the governor of a future year.

Ridgeway, T. S., (geologist) Mansfield, furnishes a historical account of the potato from its original discovery in Columbia and Peru, in South America, where it was found wild in its native soil on the slopes of the Andes, several thousand feet above the level of the sea. Thence it was taken, some 250 years ago, into Spain and England; and from the last named country it was introduced into Ireland, where the field cultivation became so general, that it gave rise to the name of "Irish potato." He believes that the primary, or true cause of the disease, is owing to the removal of the plant from a rarefied atmosphere, several thousand feet above the sea, to a dense one containing a superabundance of hydrogen near the sea.

The condition of the atmosphere in which a majority of the potato crops have been raised for the last eighty years is totally uncongenial with the plant. Secondary causes, generating curl, rust, stem rot and wet rot, are sudden transitions of weather, over cultivation, by the application of too much manure in the shape of dung, ammonia, alkali, &c.; also inferior planting localities, such as compact soils, low lands, &c.

Cure.—"Get the tuber or seed from its indigenous soil,—Columbia or Peru, South America." The potato requires a rarefied atmosphere, containing less moisture than that near the

sea; also circulation of air between the tubers; hence the necessity of porous soils.

Robbins, L. T., Plymouth, thinks he has discovered a sure remedy in the following "*Recipe.*—Turn two quarts of boiling water to half a pint of coal tar; mix with one bushel slacked lime, or in that proportion for a greater or less quantity; put one gill of this mixture in the hill at planting, and when the bloom appears on the plant, sift a small quantity over the plant and round near the root."

Rodgers, T. P., Boston. *Prevention.*—"Take potatoes uninfected, and whose ancestors were uninfected; plant on common mowing without manure, or on land no richer, and have them covered nine inches during the warm, wet weather, about harvest time. This method I have seen tried in this and other states many times without fail.

Soule, Jona., Middleborough (four papers). *Cause.*—Owing partly to soil. A black heavy soil will be more disposed to the rot, than a light, porous soil. He recommends coarse, strawy, barn manure. He thinks the rot is occasioned by rain about the time the potato is maturing in August.

Spooner, Alden, Athol. An able essay of ten pages. He supposes the cause to be in the *atmosphere and soil* acting on the root and branch simultaneously, and most powerfully during the humid and pestilential month of August. By actual experiment he recommends bringing the subsoil over the topsoil for cultivation. He says, "I made two trenches in different parts of my field, twenty feet long and two feet wide. I drew off the surface soil on one side, and threw up the subsoil on the other, to the depth of five or six inches below the bottom of the surface soil. I then drew into the bottom the surface soil and drew over it the subsoil taken from the bottom, to the depth of five or six inches. I then spread over some good, fine manure, mixed with some plaster and ashes, causing the whole to be well incorporated with the earth, making a wide, flat hill,

and cultivating as usual. The potatoes on these beds were all sound and of medium size, while those in the other parts of the field were all diseased."

Thomas, Hines, Monroe, thinks "the potato rot begins by fermentation of the water in the vine or plant; and when fermentation ends, putrefaction begins;" the disease passing from the tops to the potato. *Remedy.*—Plant good sized, healthy potatoes, in *dry* rich soil. Different kinds of potatoes should not be mixed, or planted near each other, and not be suffered much to sprout before planting.

Towle, Thomas, Newburyport, purifies his seed potatoes with the fumes of brimstone in this manner. "I took a tight barrel, and made a frame across the middle, and put a roll of brimstone four inches long, in a hot skillet under this barrel. The seed potatoes being on the frame above, and the lower head of the barrel having been previously removed, I bored two augur holes in opposite sides of the barrel for the purpose of ventilation, and in that situation let it remain about six hours, till the smoke had evaporated."

Tucker, Mary, Neponset. From experiments actually made, thinks the cause is in the depredations of certain insects, and that she has discovered the only true remedy.

Tucker, Sidney, Middleborough, gives notice that he is trying experiments—believes the disease is caused by an insect, and may be cured by pulverized brimstone, applied in small quantities to the vines, in different stages of their growth.

Tucker, C. T., East Marshfield, transmits what he terms "a recipe for the improved culture of potatoes, amounting, as he believes, to a sure and practical remedy for the potato rot," but differing in no wise from the usual mode of culture, except planting in October, November, or December, instead of the fore part of the year; thus keeping them in the ground over winter, and digging late in the fall.

Tufts, Marshall, Lexington (four papers). Seems to think this disease like the cholera, "a scourge for the sinful in order to amendment;" and the remedy, simply nipping the disease in the bud.

Tuttle, Francis, Acton, says,—"The weed called Roman wormwood is the sole cause of the potato rot. The blossom, or flower of that weed lodges on the leaf of the potato, making a sore, which mortifies. This mortified juice of the leaf connects with the healthy part of the leaf, which circulates through the vine to the potato, and causes the rot in the potato. Now for a sure and practical *remedy*—Keep this weed with all other weeds, out of your field."

Wells, Chas. A., Boston. *Cause.*—Certain animalculæ on the potato, so small as to be invisible to the naked eye, and innumerable. *Cure.*—"Put a table-spoonful of sulphur, or brimstone as it is called, in each hill," before putting in seed. This gradually undergoes decomposition, and evolves gases which keep the potato free from this destructive animal. Then plant and cultivate in the usual way.

White, William, F., Framingham. *Cause.*—A very small black bug feeding on the vines in their early growth, leaving the leaf completely perforated with small holes. A blight or rust follows, descending to the tuber and causing its decay. *Remedy.*—Select new land, manure lightly, putting a small portion of wood ashes in each hill before planting; then dust ashes thoroughly upon the upper and under sides of the leaves of the vines during their growth. Lastly, should the blight or rust appear when the potato is full grown, mow the vines.

Winchester, Jonathan, Ashburnham, having thought much on the subject from the commencement of the potato disease, gives the result of his experience, which, in one respect, at least, is like that of many others; that a dry, light soil, is much more congenial to the soundness and health of the potato, than low, moist, heavy land. He says:—"In the spring of 1844, I

planted two pieces of land with potatoes; one was a low, naturally moist piece of land; the other a dry, loamy, somewhat light soil. On the former, I hardly realized my seed, so extensive was the disease; while on the latter, there was no appearance of disease at the time of digging or afterward, the potatoes looking as well in the spring as at the time of digging." Since then he has followed the same practice in the choice of soil for planting, with uniformly the same success, always being careful to incorporate the manure well with the soil in the hill before planting.

Wright, T. K., Westhampton, thinks the *cause* to be too much exposure to the air. The natural place of the potato is under ground where it should be kept as much as possible. *Remedy*, and explanation.—"1. Potatoes kept in the ground will come up about ten days sooner than those kept in the cellar, and will look much more vigorous through the season. 2. They yield more. 3. They will not rot. 4. The disease is contagious, and will spread through the whole patch."

FOREIGN COMMUNICATIONS.

Adams, Stephen, West Newfield, Me., merely inquires if a non-resident can obtain the reward.

Billings, S. X., Knoxville, Pa., offers the following *preventive*:—"Take three pounds of alum dissolved in water sufficient to cover one bushel of potatoes. Let the potatoes remain in this water twenty-four hours before planting. Then plant and cultivate as usual." This experiment has been tried two years, and the potatoes at digging were found to be perfectly sound, while others planted in the same field, would be rotten, or have the appearance of disease. The author thinks potatoes produced from this experiment, will remain sound, or not need a repetition of this experiment for four years.

Brewster, William, Somersworth, Great Falls, N. H., thinks the cause of this disease is a severe rust, taking place in the potato top or stalk, and descending through that, to the potato, which becomes affected thereby. The larger the stalks of the potatoes, the more exposed will they be to the rust; of course, rich land producing an abundance of top, is less favorable to the health and soundness of the bulb. His remedy is cutting the tops off close to the ground, as soon as the rust begins to appear, which may be ascertained by watching them daily. Pulling the tops from the potatoes will, it is true, prevent the further growth, but so will the rust. Digging the potatoes while the tops are green, and depositing them in small quantities in a cool cellar, may preserve their soundness. He recommends *early planting*, so that the potatoes can get their growth, if possible, before the rust makes its appearance; but if the rust should overtake them, cut them immediately, close to the ground, as before mentioned.

Brittain, John, Newark, N. J., contends that the disease is inherited by the potato, which may preserve the appearance of soundness before planting, from year to year, and that in the great variety of soils, all of which contain more or less of the ingredients which corrupt the potato, much attention is requisite. The unfavorable qualities in the soil should be neutralized.

His remedy is one table spoonful of common soot, same quantity of pulverized flower of sulphur, and as much carbonate of ammonia or hartshorn, as can lay on a ninepenny piece, applied to the top of the manure in each hill.

Bogert, Mrs. Thomas L., Utica, N. Y. *Experiment.*—In 1846, several potatoes much affected with the rot, having a few sound eyes remaining, were found, on examination by a microscope, to be covered with innumerable living creatures. The potatoes were preserved, and at planting time well washed and well sprinkled over with air-slacked lime, as in the preparation of wheat, and then planted about three feet from the main field, after throwing into each hill a handful of lime. When dug, every potato was sound, fair and smooth. Since then the potato-fields have been manured with lime, to destroy the grub, and found to be much improved, while neighboring fields were not worth digging.

Remedy.—Wash the potatoes, throw over them slacked lime so as to cover them, as in the preparation of wheat, then plant.

Croft, Thomas, New Orleans, La., claims to have discovered a remedy, but refers to his manuscript, at the Patent Office, in Washington, for the particulars.

Dawson, J. W., Pictou, N. S., Superintendent of Education in Nova Scotia, &c., furnishes a very able, interesting, scientific, and carefully-written essay, which, for the benefit of the public, it would be well to publish entire; but important parts of which, in this limited abstract, it is necessary to omit. His treatment of "the nature, causes, and prevention of the failure of the potato crop," is more full perhaps, than that of any other

writer, embracing substantially all that has been said on secondary and predisposing causes, by the most sensible writers, while it confirms their suggestions and opinions. The similarity in the views of all these writers, as far as they are expressed, is a striking confirmation of their correctness.

After many pertinent, but general remarks, by way of introduction, Mr. Dawson proceeds to consider *the nature of the disease.*

1. The general diffusion and simultaneous occurrence of the disease over extensive regions, is a remarkable fact; and the exceptions arising from the differences of soil and other causes, are also very instructive in suggesting remedial measures. Some of these exceptions will be considered subsequently.

2. The disease has usually attacked the crop at that stage of the growth, when the tops are fully formed, and the formation and filling up of the underground tubers are most rapidly proceeding. Yet early potatoes often pass this critical period in safety, while those which are late are attacked; showing that the weather or temperature acts with, or against the predisposition at this particular stage of growth, and modifies its influence.

3. The disease has usually first made its appearance in the leaves, and descended from these to the stems or roots. The remainder, under this head, containing a minute description of the whole process of the disease, better adapted to scientific men than to common readers, is necessarily omitted.

As to *causes*, two important truths, deducible from the facts already stated, at once meet us.

1st. A disease so general and widely spread, probably primarily depends on some great, and generally operating, predisposing cause. 2ndly. Nothwithstanding this, it is locally induced or prevented by the action of a great number of secondary causes, which favor or arrest its development, and which yet cannot be considered as the *primary* causes of its appearance. Let us inquire first, into

2. *The inducing or secondary causes of the disease, and remedies or palliatives founded on their study.*

Most of these causes it will be necessary merely to name, as

the greater number of practical men are well acquainted with them. The principal are wet and undrained soils, wet seasons, wet weather after warm, dry weather, when the tops are fully grown; chilly nights succeeding hot days, rank manure in contact with the sets, want of attention to keeping the crop well tilled and free from weeds, run-out seed long cultivated on the same farm. These and similar causes have evidently had an important influence in locally developing the disease, but *none of them can be its general cause*, since the disease often appears where all are absent, and these causes were quite as general as now, in former times, without producing any such consequence as the potato blight. Some valuable hints, however, as to the best palliatives or temporary remedies for the disease, can be derived from these causes, in connection with the experience of farmers. Of these, the following are very important

Remedies or Palliatives.

1. *Early planting*, and planting early roots; because this gives greater probability of avoiding the effects of autumnal chills and rains. This remedy has been found very effectual in Nova Scotia.

2. *Change of seed*, especially from poor and cold localities, to richer and milder situations. The Scottish low country farmers have obtained excellent results by importing seed potatoes from the bleak and poor highland districts.

3. *Selecting* those *varieties* which have proved *least liable* to the disease; and these will generally be found to be such as have been recently introduced, or lately procured from the seed.

4. *Planting in dry soils*, and underdraining more moist soils, if necessary to plant in them. The dry, sandy uplands of King's County, in Nova Scotia, have almost entirely escaped the disease, when the crop has been put in early.

5. Applying *well-rotted manure*, and plowing it *in*, instead of putting it with the seed in the drills. *Guano* and composts made with *liquid manure*, have proved themselves better than stable manure. This and the two last remedial agents act by giving the plants a greater degree of healthy, general vigor,

than they could derive from run-out seed, in wet soil, or in contact with rank manure.

6. Planting in *new soil* and the use of *mineral manures.* It is generally observed that the potato has been most healthy when planted in new, virgin soil, before the unskilful agriculturist has extracted from it the stores of alkaline and other mineral manures remaining in it from the ashes of the forest. The composition of the ash of the potato at once explains the reason of this, as the following table, taken from Johnson, will show:—

Ashes in 10,000 lbs. of the roots and stems of the potato.

	Roots.	Tops.
Potash, - - - -	40.28	81.9
Soda, - - - -	23.34	0.9
Lime, - - - -	3.31	129.7
Magnesia, - - -	3.24	17.0
Alumina, - - - -	0.50	0.4
Ox. iron, - - - -	0.32	0.2
Silica, - - - -	0.84	49.4
Suphuric acid, - - -	5.40	4.2
Phosphoric do. - - -	4.01	19.7
Chlorine, - - - -	1.60	5.0
	82.83	308.4

Here we have very large proportions of lime and potash; the latter forming nearly 50 per cent. of the ashes of the roots. Now these substances, potash especially, are plentifully supplied to the soil by the ashes of the woods, and are usually deficient in exhausted lands. Hence, if we apply to run-out, or long cultivated soil, lime, wood-ashes, gypsum, (sulphate of lime,) common salt, (chloride of sodium,) bone dust, (phosphate of lime,) we supply it with some or all of the more important substances in the above table, and thus assimilate it to the virgin soil in which experience proves the potato to thrive best. I have found, by experience, that healthy potatoes (though not a large crop) could be obtained by planting with

no other manure than a pint of unleached wood ashes in each hill, in seasons when potatoes planted with ordinary manure were blighted.

For the same reasons it is, of course, unwise to raise successive crops of potatoes on the same soil. Whenever, on old land, a proper rotation of crops is not attended to, there is much greater likelihood of failure.

7. Storing in dry cellars is of the first importance, when the crop is infected. I have found that potatoes in which brown spots of disease were already formed, had the progress of the change arrested by being kept dry; and that the diseased spots dried up and lost their putrescent character.

8. Where there is no hope of otherwise raising a crop, the rotting potatoes may be grated or ground up, and the farina or starch saved. With a little extra washing, it will be nearly as good in quality, though usually less in quantity, than that from sound potatoes.

All the above, and probably other expedients, have been already approved by experience, as useful palliatives. In short, anything that tends to place the plant in a natural and healthy condition, appears to give it a much greater power of resisting the cause of disease, whatever that may be.

None of these secondary or partial remedies, however, can be expected to eradicate the disease. They may temporarily prevent it; or, when present, mitigate its violence, or diminish the loss resulting from it. But I shall presently show, that we have no reason to suppose that any, or all of them, can effect a perfect cure.

We proceed then, in the next place, to inquire into the

Primary or predisposing cause of the Disease and its remedies.

Almost every fact that can be collected, seems to indicate that there must be some general cause of this nature, which began to operate only in modern times; and which has, during the last few years, been almost universally active, but modified by the influence of the secondary causes above referred to.

The ordinary popular resource in seeking for the origin of the wide-spread epidemic, is to refer them to the atmosphere.

"It is in the air," appears often to be thought a satisfactory explanation. If we ask for proof, none can be obtained either from chemistry or meteorology. If atmospheric, then the cause of the evil is likely at once to be beyond our cognizance and control; besides, we are at a loss, on this hypothesis, to account for the apparently almost entire limitation of the disease to one cultivated plant.

On the contrary, every point in the nature of the disease, and the means hitherto found useful in counteracting it, indicate that the defect is in the plant itself; that from some cause its vital force has been weakened, so that putrefactive processes lay hold on the substances, which in a healthy state it could retain unchanged; and that these putrefactive changes can be arrested only when the circumstances are in all respects healthy; while unfavorable circumstances, which in former years produced no effect, are now speedily fatal.

Is there, then, anything in the past history or present condition of the plant, likely to produce such an effect? I have long thought that there is such a cause, and shall now proceed to explain it, in connection with the only means of counteraction which have suggested themselves.

Of all our crops, the potato alone has been continuously propagated by natural or artificial division of the plant. The tuber of the potato is a sort of underground stem, with eyes or buds intended to produce young shoots in the year following the formation of the tuber, and with a store of starch, albumen, &c., to nourish these young shoots in the early stages of their growth. These tubers, then, in the natural state of the plant, must serve to continue its existence from year to year, and to extend the individual plant into a group or bed of greater or less extent. But this process is not intended to be perpetual. The longest lived forest tree must eventually die, and so must the group or stool of the potatoes, which, originally founded by a single seed from a ball, is only one plant increased in extent by a spontaneous division of its roots into detached tubers. It gradually exhausts the neighboring soil, and its own vital energy diminishes, and at length it will die out; and if a new

plant occupy its place, it must be a seedling produced from the balls which have fallen on the spot.

If then, since the potato was introduced into Europe about 250 years ago, we have been continuing its cultivation solely by division or separation of the tubers, we have been perpetuating the life of one individual plant; and we must have now potatoes that are the descendants of those imported by Raleigh, not by natural generation through the seed, but by indefinite division of the plant, a sort of infinitesimal fractions by a perpetual division of that now extremely aged individual potato. Have we a right to expect that such plants should be healthy? We may not know the minute changes which bring about the debility of age, but we know that such debility does overtake plants, as well as animals. Fine varieties of carnation propagated by cuttings or layers, in a few years degenerate, and must be abandoned by the florist. The same happens to other florists' flowers, though in some more slowly. Grafting and budding fruit trees, is but continuing the lives of individuals, and despite the vigor of the new stock, grafts from very aged trees of old varieties, show the debility of the parent. Hence, most of the finest fruits of a century or two ago, have degenerated and become less worthy of cultivation, and have been replaced by new varieties from the seed. This seems to be one of the great laws of vegetable life, and accordingly even those plants which, like the potato, have been furnished with tubers to provide for the continuance of individual life, have also been provided with seeds to produce new individuals, and thus permanently continue the species.

Taking this view of the matter, we should rather wonder that the potato has lasted so long, than that it now fails. We can, in truth, account for its long duration, only by taking into consideration the varieties of soils and climates in which it has been cultivated, the frequent changes of seed, and the occasional raising of new varieties from the ball.

If, however, this cause has had any real influence on the plant, why has it not merely run out or died of old age, instead of contracting a malignant and fatal disease. In answer to this, I may remark that the disease in question is, in fact, merely

the death and consequent putrefaction of parts of the tissues of the plant. Further, the analogy of other vegetables leads us to believe that plants do not always simply die out, under the influences of degeneracy or old age. The worn out carnation loses the size and brilliancy of its flowers; the old varieties of fruit trees lose their vigor of growth, degenerate in their fruit, and become very liable to the attacks of parasitic fungi and animals; the ancient forest, its trees decaying at the heart, and overgrown externally with lichens, mosses, fungi, and excrescences, usually perishes by tempests or fires, before it undergoes the slow process of natural death. So with the potato. Under high cultivation, its starchy and albuminous parts, those which are valuable for human food, have been increased, while, by constant reproduction from the roots, the vitality of the living buds has been diminishing. The potato, at one time the most certain and hardy of crops, has gradually become tender. The "curl" and "dry rot" began twenty years ago to cut off the young shoots and the planted tubers, apparently because there was not sufficient vegetative life to enable the living bud to control and use the abundant nutriment for it in the cells of the tuber. This difficulty was overcome in part, by changes of seed, planting whole tubers, and other expedients; and the life of the plant was protracted a little longer, as might have been expected, to be attacked only by some worse disease. And now we have to contend with a mortification of the tissues, not in the infant stage, but in the period of the plant's fullest vigor and strength.

It may be objected, however, that even renewal from the ball has not been effectual, the seedling varieties having suffered as well as others. It must be observed, however, that seedling varieties have generally resisted the disease longer than others, and that there seems good reason to believe that the disease, like most others that originate, whether in plants or animals, from long exposure to debilitating influences, is more or less contagious. It is quite probable also, that the seed of plants which have already contracted the disease, may be itself not quite free from hereditary taint. Renewal from the seed cannot, therefore, be assumed to have been fairly tried,

unless the seedlings have been, at all stages, completely separated from the old varieties, and unless they have been derived from healthy plants, or are separated, by a sufficient number of removes, from their unhealthy progenitors.

I come now to the method which the above views would lead us to consider the only certain one, with a view to the final extirpation of the disease; and it is one requiring the means at the command of the government of a state, or some public body or institution, devoted to agricultural improvement.

It is to cultivate the potato from the ball, for several generations continuously, until the hereditary taint is removed, and then to distribute the healthy tubers to such agriculturists as will pledge themselves to abandon entirely the culture of the present exhausted and diseased varieties.

To succeed in the experiment, it should be conducted on a well managed model farm, or horticultural garden, from which the culture of the old varieties should be entirely excluded, and seed should be obtained from the balls of the most healthy potatoes.

The ground should be light and dry, and manured with a mixture of old compost, lime, gypsum, and wood ashes.

The seedlings should be carefully tended and kept very clean from weeds, and any plant in which the first signs of blight appears, should be at once destroyed.

A part of the seedlings should be carefully covered, and allowed to remain in the ground all winter. The remainder should be carefully packed in dry sand, in a cool cellar, keeping the various sorts separate.

In the second year, the same precautions should be used as to the culture of the best varieties obtained in the first year, and some of the plants should have the soil *washed* away from their roots, and the young tubers picked off, in order to ensure the production of balls. After picking off the tubers, the plants should be carefully earthed up again.

The seed from the balls of the second year, should be sown in the third year, and the whole process repeated, as before. The tubers obtained from the first sowing, should not be distributed as seed potatoes; but those from the second sowing

might, if no disease had appeared in the course of the experiments. If disease had appeared, the process should again be repeated.

The best varieties obtained from the produce of the third or second sowings, should be planted out, to furnish seed tubers, with the same precautions as to manure, &c.

The sound tubers should be given or sold to farmers, who would pledge themselves to cultivate no other varieties, so as to secure them against contagion.

A *national nursery* for new varieties of potatoes, on the above plan, should be kept up in every agricultural country, so as continually to supply new and sound varieties. Independently of the prospect of gradually restoring the potato culture, the improvement of the sorts cultivated, would amply repay the expense. In the same farm, or garden, experiments might be tried in the culture of wild varieties, obtained from the native country of the potato.

The above suggestions are submitted as probably far superior to any founded on the belief of any one method or substance being effectual as a cure. Such partial remedies, though they may be temporarily successful in particular soils or seasons, never can effect the general or permanent removal of the evil.

Frencher, Smith, Broome County, N. York, believes the *cause* a fly, secreting itself under the top leaves, laying in the stalk a nit, which becomes a small worm, descending in the stalk, which soon begins to turn black and die. *Cure.*—Scatter plentifully over the leaves, while they are covered with a heavy dew, in dry weather, *slacked lime;* and repeat the same if necessary. Frequent experiments have proved this unfailing.

Flournoy, J. F., "Nigh Athens," Georgia (two communications). *Cause.*—"Moist soils." *Cure.*—Take 1 bushel slacked lime, 5 bushels soot, 1 quart alum, 1 pint ammonia, mix and apply a due proportion to each hill, on a quarter or an eighth of an acre, according to the moisture or dryness of the soil.

Franz, J. Hahn, Kutytown, Berk County, Pa., seems to

agree substantially with Mr. Dawson, that propagating from the bulb or tuber continuously, for a great length of time, will cause a degeneracy and failure in the health and soundness of the plant, the seed of which should once in a few years be renewed from the ball; and once in many years, if possible, from the native place of the plant, in South America. Mr. F. recommends planting on dry, sandy soil; or if moist soil only can be obtained, on layers of chopped straw, in the hill. The straw will protect against excess of wet, make the soil better, and contribute to the nourishment and health of the potato.

Freeman, G. M., York, Me. *Remedy.*—Charcoal dust, two parts; wood ashes, two parts; slacked lime, one part; apply one quart per hill, which is manure sufficient in any virgin soil suitable for the potatoes; viz., two thirds under the seed and top of the hill at planting: the remainder (without the lime), around the plants when fully grown.

Gale, N. H., New York, N. Y. Essay of eleven pages, containing some good common sense. He supposes the rot to be a disease in the potato, as the cholera is in the human race; "and that the awful ravages, in each, result from like causes;—in the potato, from its weak, sickly, exhausted condition, arising from erroneous cultivation;—in man, from his intemperance, debauchery, and a like broken constitution." He supposes the rot in a measure contagious, affecting the neighboring vines; and recommends procuring the seed for planting, as far distant as possible from the place of disease; and then to plant none but large, fair, *whole* potatoes. Like Mr. Dadd, he abhors the practice of planting *cut* potatoes, or pieces, as well as whole ones, of an inferior quality.

Grothie, Charles, Milwaukie, (German). Is lost in generalities. He is too little acquainted with the English language to be intelligible.

Haines, Herman, Cannonsburg, Pa., asks for information but conveys none.

Hawes, Dwight H., Honesdale, Pa. *Cause.*—Sudden, warm rains on the growing plant, where it has been predisposed by careless and insufficient cultivation to take the disease. Want of a sufficient depth of earth in covering and hoeing, the author considers a prominent predisposing cause. *Remedy.*—Renew the seed from the balls to avoid the present predisposition. Plough thoroughly. Plant, cover and hoe the potatoes with much earth.

Hooke, H. M., Pelham, N. H., (more recently of Lowell, Mass.) offers a communication of great length, ably written, evidently embodying the result of much mental labor and deep research. And it is because many of the facts and arguments here presented have been traversed by others, already recorded, and not because these are less interesting, that it is deemed necessary in this brief abstract, already extended to greater length than first calculated, to omit to notice some important parts of this essay, which would otherwise have been recorded at full length. The original place of discovery, for instance, was given in the communication of T. S. Ridgeway; and the formation of the plant, more fully, in that of J. W. Dawson.

Mr. Hooke notices the striking fact that the disease occurred in different parts of the globe about the same time, which seems to prove some deficiency in the atmosphere, or that the atmosphere contains a specific poison so subtle, as hitherto to have eluded our senses. If indeed an aerial element, necessary to the growth of the potato, is withdrawn, the sequence will be a partial or total decomposition of the root, caused by the interruption of that process, by which the various parts of the root are developed. If it be then asked why all fields are not equally diseased, it may be asked, in turn, why all individuals are not equally affected by atmospheric epidemics. We *do* answer that some fields have the proper preventive agent. Then it will be asked what fields? Experience answers, those best supplied with carbon, and in condition to supply the potato.

(Omitting a minute description of the formation of the potato,) it should be borne in mind, that the part first diseased is composed of 24 parts of carbon, 21 of oxygen, and 21 of hy-

drogen. Therefore, when there are carbonates in the soil, or a due supply of carbonic acid in the air, the potato plant takes the carbon, and sets the carbonic acid free.

The *cause* of the decay or rot therefore must be *a deficiency of the carbonic acid in the air.* Why? 1. Because of the *decrease* of the *carbonic acid* which has been *going on for ages*, in consequence of the *growth of the whole vegetable kingdom.* 2. Because the disease has been prevented just so far as the root and plant have been supplied with *carbon*—by charcoal, carbonate of lime, or any substance rich in carbon.

The carbonates, or preventives, to be effectual, must be so applied that the potato can draw from it.

The deficiency of the carbon (the cause of the disease) is both in the *soil and atmosphere.* But a newly cleared and burnt piece of ground, it is said, will produce sound potatoes. Now if vegetation absorbs carbonic acid, why this result, since there was so recently a large growth of wood on the land now cleared? The reason is obvious. There is a supply of carbon from the *charcoal* and *ashes* left on the ground after burning, as well as in the soil, which has not been overworked and exhausted, but has rather been supplied from the falling and decay of the *carboniferous* growth of ages before.

During the earlier periods of the earth's history, the atmosphere was much more highly charged with carbonic acid, than at the present time. Of this there is abundant proof; and to this redundancy of carbonic acid may be attributed the luxuriant growth of vegetation peculiar to those periods; which growing up and falling down, have produced those vast beds of *coal*, or disintegrated vegetable matter, which remain to the present time, and fully indicate a much larger growth of forests, than are at present known.

Coal is composed of vegetable matter, transmuted by petrefaction of a peculiar kind, beneath the surface of the water, and in the absence of air. Many species of plants which grew luxuriantly then are now extinct. They passed away with the decrease of carbonic acid gas that supported them. They lived till they fulfilled the important work assigned them, viz., clearing the atmosphere of a redundance of carbonic acid—a

matter in excess noxious to animal life, though highly important in a due proportion, and in storing up mineral masses, destined in process of time to be of great service to man.

At a later period more dry land appeared, and the earth became covered more with trees and other vegetable growth, by which the carbonic acid became so exhausted as to become fit for the inhabitation of man.

This exhaustion from various causes, has been going on more or less rapidly, until even man is being affected by the great absorption of carbonic acid gas, as appears by the increase of disease in the respiratory and nervous system of man, one of the first symptoms in consumption being a loss of fat, caused by a deficiency of carbon. The blood too of consumptive patients is very thin and florid, showing a highly oxygenated condition and deficiency of carbon; and the best remedies are those rich in carbon, as cod-liver oil, naptha and the like; and the respiratory tube acts beneficially, by retaining carbon in the lungs.

But to return; it may be asked, why the potato rot begins in the cell wall? Answer, because this part is required to hold its contents during growth, and if deprived of its carbon, which gives it firmness, it will burst, and from the breach arise the fungi.

Again, it may be asked, if the disease arise from defective growth, why it ever attacks the potato after taken from the ground? Answer, the rot might be expected from a watery potato of imperfect growth, or contagion might communicate it.

Why should not species of vegetables pass away at this age, as well as at a former one? They do and will, unless means be applied for their preservation.

But vegetables are not alone in passing away. Whole races of *animals*, of enormous growth, have become extinct, as the mammoth, the mastodon, &c., of whose former existence in our own country there is abundant proof.

Much carbonic acid has been abstracted by the growth of vegetation, but more by carboniferous deposits. Every cubic yard of lime is supposed to contain 10,000 cubic feet of carbonic acid gas. The quantity also in coal beds, containing 64 to 75 per cent. carbon, must be enormous.

An atmosphere charged with carbonic acid gas, as high as 8 or 12 per cent., would not support land-animal life, but would help forward a luxuriant growth of land vegetables. The atmosphere now does not contain $\frac{1}{2000}$ of this gas.

Hoskins, Cheney, Bel Air, Maryland, wants further information.

Irish, H. D., Turner, Me., thinks he has discovered the cause of the disease in a small worm, half an inch long, which he found in the stock, by cutting it off below where it was withered. He is confident that the decay thus caused in the stock descends to the tuber, and produces the disease, the remedy of which may be quick-lime, if applied so as to touch the worms. Or lime water, or dry lime will answer.

Johnson, Micajah, T., Short Creek, Ohio, makes some good suggestions, but they have been made substantially by others —are well understood, and generally agreed upon; such as that the ground selected for planting, should be high and dry, of a light quality and light color, where it is exposed to constant or frequent breezes, and the heat is never excessive. Locations are unfavorable, where the sun is very hot by day, and the nights are cool. These sudden changes from heat to cold rupture the small vessels in the tuber, and cause the rot.

Kentish, Charles A., New York, N. Y., "manufactures an agricultural fertilizer," which he terms "prepared or artificial guano," one of the virtues of which is to kill all insects and prevent rot in potatoes. To prove its efficacy, he offers a certificate from G. Preant, White Plains, N. Y., saying:—"I have used 'Kentish's prepared guano,' this season, on potatoes. My crop was large and all sound. Where I did not use it, the potatoes were all rotten and worthless. My neighbors also, who have not used this fertilizer, have not raised a saleable potato."

Mr. K. proposes to furnish three or four barrels, enough for an acre of potatoes, as a test.

Lambourn, Isaac E., Cassapolis, Mich., professes to be "in possession of the information required;" and makes proposals.

Lazelere, A. De, Columbus, N. J., by way of preventive uses slack lime and salt on stable manure, in proportion of one bushel of lime slacked, and one bushel of salt, in a cask of liquid, large enough to make a whitewash, to four loads of stable manure. Then saturate, and use one fork-full to each hill.

Lewis, Abner, East Poultney, Vt., "has found a new way of raising potatoes, free from rot or rust, of a much better quality and more abundant crop. Plough, harrow, and furrow, lightly. Plant early, covering the potatoes first with a handful of leaves, then lightly with dirt. Hoe the plant when small, then plaster."

Probably the leaves and plaster have a tendency to preserve the soundness, and improve the quality of the potatoes.

Morrison, Thomas D., believes the *cause* to be overheating, which commences in the tops and descends to the roots—occasioned by the south winds. He planted an acre of potatoes, a part of the field being near to, and north of a shed 50 feet long, and when the storms came and the wind blew and beat upon that field, that part protected by the shed, stood its ground unmolested, while the remainder withered and perished. *Remedy.* —Plant three or four kernels of corn one side of each hill, to protect from the wind. This experiment has proved perfectly successful two years.

Moore, John, Candia, N. H., like several others, believes the *cause* a small fly or bug, which perforates the leaf and stalk, causing the virus, thus introduced, to descend and poison the potato. He believes that *the remedy* is in tobacco juice, lime and salt, sprinkled upon the tops repeatedly during their growth, in proportion of one pound of tobacco, (or all its strength in juice) two quarts of unslacked lime, and one quart of salt, to half a barrel of water. Sprinkle and wet the tops, especially after rains, three or four times during growth.

Morrill, Philip, Glenburn, Me., in a printed communication, makes several inquiries, as to residence required, &c., and professes to have discovered the cause, but does not state it.

Morrow, John S., Newville, Pa., in a well written and interesting communication, seems to agree in sentiment with Mr. Dawson, and some other sensible writers, that one great cause of the failure in the potato crop, is want of renewal of the seed. Too long a production from the same stock has caused the plant, like an old tree, or ingraftings from old trees, to become worn out by age. As to *remedy* he says,—"The only way, therefore, to avoid the potato rot is to *renew* the *vigor of the plant*, which is all that is wanted, by *growing fresh seed* taken from the *potato apple*, and the writer will vouch for the experiment.

"In the summer of 1848, I grew some small potatoes from the apple, (or natural seed,) and in the spring of 1849 I planted the *new seed* in my lot, in a row parallel with and adjoining other rows planted with old seed. When the product of the *old seed* was uncovered, the rows presented a mass of decomposed matter, which emitted a very offensive smell. On opening the row in which the new seed was planted the potatoes were found to be matured, healthy and vigorous. In 1850 I made a similar experiment with the same seed, and found a similar result."

Nicholson, Joseph, Millerstown, Pa., writes *to obtain* information.

Ostrander, R. T., Geneva, Walworth County, Wis., recommends planting on the top of the soil, and covering with straw, without hilling or even stirring the ground more than to keep down the weeds. "Never plant in a hollow, or with loose soil beneath, and your crop will be certain."

Page, Benjamin, near Massilon, Ohio, recommends the use of plaster of Paris, or gypsum, as a preventive. He says: "In 1850, while planting my potatoes, I tried lime, charcoal,

ashes, soot, salt, and gypsum, each separately. The last, alone, entirely prevented the disease."

Application.—At the time of planting, scatter a little over the potatoes, say a gill on each hill, and as much more about the plant, when a few inches above ground.

Parker, Isaac, Potsdam, N. Y., requests information.

Parlee, A. R., Skeneateles, N. Y., thinks the disease is caused by a small insect, which commences its ravages in hot weather, the latter part of June.

Remedy.—Drop a small handful of salt on the potatoes in each hill before planting. About the first of July scatter a handful of lime on the plants of each hill, in proportion of three bushels to the acre. Repeat the same about 20th July and 10th August.

Perley, Nathaniel, Ottaway, Illinois, found, when the rot commenced, a small insect in the pith of the stock, head downward, going down. This insects enters under a large branch of the main stock, which begins to decay—sooner or later, according to the weather. The insect becomes a worm or maggot, as it nears the ground.

Remedy.—Cut the vines by a scythe within four inches of the ground, on the appearance of decay, and sow broadcast from two to three bushels of air slacked lime to the acre, leaving the vines on the ground. He has found this effectual in preserving his potatoes in a sound state, for three successive years, while his neighbors' crops have been damaged by the rot.

Quinby, Josiah, Readington, N. J., requests information.

Randall, Bryant W., Middle Island, (L. I.,) N. Y., has found by experiment a *remedy* in cutting off the vines, when they first begin to die, within two inches of the ground.

Riley, James, Cincinnati, Ohio, writes grandiloquently, but

declares that the "paltry reward" of $10,000 would be no inducement to him to make known the cause and remedy of the disease.

Root, Charles, Battle Creek, Michigan, professes to have found a remedy, and makes a proposal for its revelation.

Rotilom, Jean, Chicago, Illinois, goes into the sublime, and believes the disease is "caused by an atmospherical influence of a planet," and "will gradually discontinue in the lapse of five years," in 1856.

Ruggles, John, Duncansville, Pa., thinks the disease is caused by an insect, which deposits its eggs in the blossom—works its way to the roots, and attacks the potato. In cultivating, he selects dry land, overspread with rotten manure, and plants *cut potatoes*.

Trabue, E., and Sledge, John P., Oakland Farm, 3 miles east of Nashville, Tennessee, recommend for manures, straw, leaves, grass, or vegetable manures, and to avoid all strong manures; and for seed they recommend, contrary to the experience of all the best writers, the planting of small potatoes. They also recommend frequently renewing the seed from the ball.

Smith, G. W., Glen Aubra, N. Y., thinks the disease has been caused by a violation of the laws of nature in our mode of cultivation. His plan is to leave in the ground over winter that portion of the crop intended for seed, in the place where they grew, taking away only the surplusage, or what remains, in the spring, more than what is necessary for seed. This experiment has been tried successfully four years. Mr. S. grew his potatoes on a sandy, loam soil, under a high state of cultivation, where the potatoes, kept in the ground for the next year's crop, needed no extra covering to protect them from the frost. In a more exposed situation he thinks it might be necessary to cover the ground with chaff, straw, or other convenient

material. The same experiment, substantially, has been tried with success by others.

Smith, J. Lee, Milwaukie, Wis., condemns the practice of planting small potatoes, and also of cut potatoes, which will cause the seed to run out and become exhausted. One of his neighbors, at his suggestion, four years ago, commenced the practice of planting his fairest, soundest, best potatoes; and the consequence has been, as might naturally have been expected, his crop every year has been fair, sound, and abundant.

Snyder, John T., Franklin, N. J., thinks one cause of the potato disease is a small bug, which enters the stock near the ground and penetrates to the root. By pulling up the vines from the ground, standing with the feet on each side and close to the vine, leaving the potatoes in the ground, will save them. Scattering a handful of ashes or a handful of plaster about the vines, on the first days of June, July, and August, he has found to be useful. He thinks insects more numerous and destructive, of late years, than formerly, owing to the killing of the birds, which he thinks ought to be prevented by law.

Stanley, John E. Jr., New Ipswich, N. H., thinks he has discovered a cheap and sure remedy, but does not yet communicate it.

Thompson, Green B., Jefferson Barracks, Mo., is very confident he has found a certain remedy, which he is willing to make known to our legislative body, *if they accept of his terms.*

Trabue & Sledge, Nashville, Ten. Second communication. See first communication, under letter S.

Washington, Benjamin, Newport, N. J., offers the following, as a certain remedy or preventive:—

Take one bushel of ground plaster of Paris, mixed with half a bushel of wood ashes. In planting, put a common teacup full on each potato, and no disease can take place.

Watendyke, C. A., Newton, N. J., has tried the following experiment three years, with unfailing success, while his neighbors have lost almost their whole crops of potatoes by the disease.

As to the ground for planting, care should be taken to select dry, loamy soil, and to avoid low, wet ground.

"Prepare the ground in the usual way for planting in hills; put in the potatoes and sprinkle in every hill, over the potatoes, one gill of lime, (if the ground is very rich, a little more can be used,) then cover over the potatoes with ground as usual. Then take five bushels of lime, one bushel of ashes, half a bushel of fine salt, and half a bushel of ground plaster, mix well together; and of this composition sprinkle over every hill one large table spoonful. Plant early. This experiment costs but little time and expense, and will add richness to the soil."

The mode adopted by many of trying to save the crop, after the vine begins to die, Mr. W. considers futile in the extreme, the poison having already done its work, and will, sooner or later, appear. The only way is to commence right, by making the ground healthy with such articles as have a purifying tendency.

Wild, Robert, Montello Falls, Wis., writes, requesting further information.

Wood, J. C., New York, N. Y., believes that his experience will entitle his suggestions to consideration. He, like Messrs. Dawson, Hooke, and other sensible writers, believes that the power of reproduction from the tuber of the potato, is not perpetual, but may be, and has been, exhausted by length of time. He says, the potato plant in its healthy state produces abundance of seeds. The plant blossoms, the blossoms fall, and are succeeded by small white balls, full of seeds, which, if planted, produce small potatoes the first year and full sized ones the third year. Nature having thus provided, in the seeds, a natural power of reproduction, it is evident that the plant is perpetuated by the root, or without resorting to the seed; nor can a healthy plant exist from the seeds produced from a sickly

plant. The plant failed to produce its balls or seed, long before the root commenced to rot, and then the agriculturist ought to have known that the plant was failing, and to have renewed from the seeds of the wild plant, or the root from the native country. The only matter of surprise is, that the plant should so long have been propagated from the root. He is fully convinced that the only true remedy is obtaining the seed or root, in a wild state, from South America.

Woolsey, J. Wm., Quebec, L. C., has been informed, by one who had tried it, that pulverized gypsum applied upon the potato in the hill, before covering, was a sure remedy.